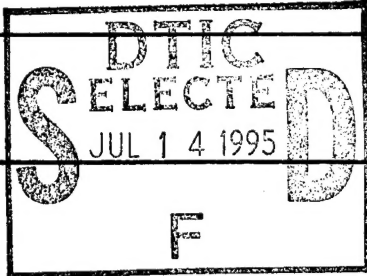


# REPORT DOCUMENTATION PAGE

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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE JUNE 1995		3. REPORT TYPE AND DATES COVERED Final Remedial Investigation	
4. TITLE AND SUBTITLE Installation Restoration Program Remedial Investigation Report Vol. III Alpena Combat Readiness Training Center Alpena MI				5. FUNDING NUMBERS PRTDVG957097	
6. AUTHOR(S) N/A					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) EARTH TECH Oak Ridge TN				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Hazardous Waste Remedial Actions Program Martin Marietta Energy Systems, Inc. Oak Ridge, TN 37831				10. SPONSORING / MONITORING AGENCY REPORT NUMBER RG-07-159-0370	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited					
12b. DISTRIBUTION CODE					
13. ABSTRACT (Maximum 200 words) Remedial Investigation Report of Sites 1-9 at Alpena CRTC, Alpena MI. Volume III Appendices A-I. A remedial investigation was performed on 9 sites at the Alpena CRTC to determine the extent of contamination at the sites. The sites involved in this investigation include: Site 1 POL Storage Area; Site 2 Motor Pool Area; Site 3 Former Garage; Site 4 Third Fire Training Area; Site 5 Second Fire Training Area; Site 6 Former Landfill; Site 7 First Fire Training Area; Site 8 Former Hanger 9; Site 10 Hazardous Waste Storage Area. Soil and groundwater contamination above state action levels was found at the sites. An FS has been initiated.					
DTIC QUALITY INSPECTED 5					
14. SUBJECT TERMS Installation Restoration Program; Air National Guard; Remedial Investigation; Alpena CRTC; Alpena MI, ANG				15. NUMBER OF PAGES 290	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCL.	18. SECURITY CLASSIFICATION OF THIS PAGE UNCL.	19. SECURITY CLASSIFICATION OF ABSTRACT UNCL.	20. LIMITATION OF ABSTRACT NONE		

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**Block 3. Type of Report and Dates Covered.** State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10 Jun 87 - 30 Jun 88).

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<b>C</b> - Contract	<b>PR</b> - Project
<b>G</b> - Grant	<b>TA</b> - Task
<b>PE</b> - Program Element	<b>WU</b> - Work Unit Accession No.

**Block 6. Author(s).** Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).

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**DOD** - See DoDD 5230.24, "Distribution Statements on Technical Documents."  
**DOE** - See authorities.  
**NASA** - See Handbook NHB 2200.2.  
**NTIS** - Leave blank.

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**Block 13. Abstract.** Include a brief (*Maximum 200 words*) factual summary of the most significant information contained in the report.

**Block 14. Subject Terms.** Keywords or phrases identifying major subjects in the report.

**Block 15. Number of Pages.** Enter the total number of pages.

**Block 16. Price Code.** Enter appropriate price code (*NTIS only*).

**Blocks 17. - 19. Security Classifications.** Self-explanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.

**Block 20. Limitation of Abstract.** This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.



# INSTALLATION RESTORATION PROGRAM

## FINAL REMEDIAL INVESTIGATION REPORT

### VOLUME III: APPENDICES A - I

ALPENA COMBAT READINESS TRAINING CENTER  
ALPENA COUNTY REGIONAL AIRPORT, MICHIGAN AIR NATIONAL GUARD  
ALPENA, MICHIGAN

JUNE 1995



450 01705661

**HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM**  
**Environmental Restoration and Waste Management Programs**  
Oak Ridge, Tennessee 37831-7606  
managed by MARTIN MARIETTA ENERGY SYSTEMS, INC.  
for the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-84OR21400



**REMEDIAL INVESTIGATION REPORT  
ALPENA COMBAT READINESS TRAINING CENTER  
MICHIGAN AIR NATIONAL GUARD  
ALPENA, MICHIGAN**

Volume III

Appendix

- A Field Change Request Forms
- B Aquifer Testing Results
- C Soil Boring Log; Monitoring Well Construction Forms and Technical Results
- D Analytical Results; Initial Site Screening
- E Analytical Results; On-site Screening
- F Surface Water and Sediment Sampling Forms
- G Monitoring Well Development and Sampling Forms
- H Surveying Data
- I Analytical Results; Investigation Derived Wastes - Decontamination Water and Soil Cuttings

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
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A-1	



## **Appendix A: Field Change Request Forms**





## FIELD CHANGE REQUEST FORM

Field Change No. 1Page 1 of 1PROJECT Phelps Collins ANG RI, Alpena, MichPROJECT NO. 931800-12APPLICABLE DOCUMENT: Final RI SAP

## DESCRIPTION:

page 2-29 of SAP states "shoreline sampling will be cored using a minuteman portable drill apparatus" field team suggests using a sediment/sludge sampling hand auger.

## REASON:

uncompacted, saturated sediments in the bottom of the sinkhole will not allow for a borehole to stay open; using a minuteman would not allow for sampling

## RECOMMENDED DISPOSITION:

Use hand auger with sediment catcher attachment; samples will be collected in 5.5 steel liners if possible; Placed into jars if sleeves will not work

## IMPACT ON PRESENT AND COMPLETED WORK:

no cost change; however, deeper sample collection (3 to 5 feet) will not be practical if the holes will not stay open

## FINAL DISPOSITION:

REQUESTED BY:  
FIELD / PROJECT MANAGER:J. Buegel 7/29/93APPROVALS:  
HAZWRAP PROJECT MANAGER:

Field Change Request

Project name <u>Phelps Collins AWG</u>	Project Number <u>931800</u>
Applicable Document <u>RI SAP Final</u>	Date <u>8/11/93</u>

Description: Where possible  
Surface soil samples will be collected  
using the drill rig, 3", 2-foot long split spoons  
equipped w/ stainless steel liners; SAP says we will use  
a hand auger

Minor change ☒ Major change ☐ Major project impact ☐

Requested by: Jack S Briegel

Reason for change:  
All soil samples will be collected with the  
same methods; same rinsates, etc. Samples  
will be obtained from the first foot.

Recommended disposition:  
Approve as recommended

Impact on present and completed work:  
no impact - samples will still be representative  
of surface conditions and volatile compounds  
will be better retained.

Accepted ☒ Rejected ☐ Signature Jean E McKee Date 8-24-93  
Project Manager

Accepted ☐ Rejected ☐ Signature \_\_\_\_\_ Date \_\_\_\_\_  
Project QA/QC Officer

(Required prior to Implementation of major changes)

Accepted ☐ Rejected ☐ Signature \_\_\_\_\_ Date \_\_\_\_\_  
Program Manager

Accepted ☐ Rejected ☐ Signature \_\_\_\_\_ Date \_\_\_\_\_  
Program QA/QC Officer

(Required prior to implementation of changes with major project impact)

Approved ☐ Rejected ☐ Signature \_\_\_\_\_ Date \_\_\_\_\_  
CLIENT Project Manager

Final Disposition \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

# Field Change Request

Project name <u>Phelps Collins ANGR</u>	Project Number <u>931800-12</u>
Applicable Document <u>Final SAP Dec. 1992</u>	Date <u>Aug 24, 1993</u>

Description: Page 2-72 PSP: "newly constructed wells will be allowed to stabilize approximately one week after well development and prior to sampling". Wells will be allowed to stabilize approx 48 hr after development prior to sampling.

Minor change ☒ Major change ☐ Major project impact ☐

Requested by: Jack Briegel

Reason for change:

150 IF monitoring wells are allowed to stabilize one week after development and additional mobilization will be necessary prior to sampling these wells. 48 hrs should be sufficient time for stabilization

Recommended disposition:

Approved Recommended

Impact on present and completed work:

No impact

Accepted ☒

Rejected ☐

Signature Jean E. McKee

Project Manager

Date 8-25-93

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Project QA/QC Officer

Date \_\_\_\_\_

(Required prior to implementation of major changes)

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Program Manager

Date \_\_\_\_\_

Accepted ☐

Rejected ☐

Signature \_\_\_\_\_

Program QA/QC Officer

Date \_\_\_\_\_

(Required prior to implementation of changes with major project impact)

Approved ☐

Rejected ☐

Signature \_\_\_\_\_

CLIENT Project Manager

Date \_\_\_\_\_

Final Disposition \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_





**Appendix B: Groundwater and Surface Water Elevation  
Measurements and Aquifer Testing Results**



LOCATION	ID NUMBER	DATE	ELEVATION OF REFERENCE POINT		DEPTH TO GRNDWT	GROUNDWATER ELEVATION
			TOP OF PRO CASING	TOP OF PVC RISER		
SITE 1	S1MW1	SEPT. 12. 1993		678.23	1.64	676.59
	S1MW2	SEPT. 12. 1993		681.16	3.77	677.39
	S1MW3	SEPT. 12. 1993		680.55	3.4	677.15
	S1MW4	SEPT. 12. 1993		678.94	2.74	676.2
	S1MW6	SEPT. 12. 1993		680.66	4.46	676.2
	S1MW11	SEPT. 12. 1993		679.28	3.56	675.72
	S1MW12	SEPT. 12. 1993		677.74	3.19	674.55
	S1MW13	SEPT. 12. 1993		680.2	4.99	675.21
	S1MW14	SEPT. 12. 1993		680.27	6.35	673.92
	S1MW14	SEPT. 12. 1993		682.62	5.93	676.69
SITE 2	MP2MW1	SEPT. 12. 1993		683.78	8.3	675.57
	MP2MW2	SEPT. 12. 1993	683.87	683.28	7.92	675.51
	MP2MW3	SEPT. 12. 1993	683.43	683.44	8.31	675.28
	MP2MW4	SEPT. 12. 1993	683.59	683.39	8.07	675.4
	MP2MW5	SEPT. 12. 1993	683.47	682.85	7.99	674.86
	MP2MW6	SEPT. 12. 1993		682.78	6.72	676.06
	MP2MW7	SEPT. 12. 1993		691.73	15.11	676.62
SITE 3	CG3PZ1	SEPT. 12. 1993		687.87	10.58	677.38
	CG3MW1	SEPT. 12. 1993	687.96	694.3	18.12	676.29
	CG3MW2	SEPT. 12. 1993	694.41	689.8	13.51	676.5
	CG3MW3	SEPT. 12. 1993	690.01	694	17.71	676.42
	CG3MW4	SEPT. 12. 1993	694.13	694.09	17.86	676.4
	CG3MW5	SEPT. 12. 1993	694.26	691.29	14.77	676.52
	CG3MW6	SEPT. 12. 1993		690.14	14.5	675.64
	CG3MW7	SEPT. 12. 1993		684.75	23.01	667.23
SITE 4	TF4MW1	SEPT. 12. 1993	690.24	685.91	29.02	659.61
	TF4MW2	SEPT. 12. 1993	688.63	688.41	26.94	658.06
	TF4MW3	SEPT. 12. 1993	685	690.05	27.78	658.36
	TF4MW4	SEPT. 12. 1993	686.14	680.93	6.88	674.15
SITE 5	SF5MW1	SEPT. 12. 1993	681.03	680.21	5.97	675.32
	SF5MW2	SEPT. 12. 1993	681.29	682.14	7.67	674.6
	SF5MW3	SEPT. 12. 1993	682.27	681.78	7.65	674.32
	SF5MW4	SEPT. 12. 1993	681.97	680.59	6.21	674.38
	SF5MW5	SEPT. 12. 1993		680.52	6.26	674.26
	SF5MW6	SEPT. 12. 1993		681.26	7.06	674.2
	SF5MW7	SEPT. 12. 1993		681.12	7.05	674.07
	SF5MW8	SEPT. 12. 1993		681.24	7.3	673.94
	SF5MW9	SEPT. 12. 1993		690.38	18.44	672.1
SITE 6	LF6MW1	SEPT. 12. 1993	690.54	684.86	12.33	672.68
	LF6MW2	SEPT. 12. 1993	685.01	686.97	15.21	671.93
	LF6MW3	SEPT. 12. 1993	687.14	684.59	11.84	672.75
	LF6MW4	SEPT. 12. 1993		683.71	10.64	673.07
	LF6MW5	SEPT. 12. 1993		687.18	16.01	671.17
	LF6MW6	SEPT. 12. 1993		685.01	11.89	673.12
	LF6MW8	SEPT. 12. 1993		684.21	10.87	673.34
	LF6MW9	SEPT. 12. 1993		682.7	11	671.7
	LF6MW10	SEPT. 12. 1993		687.11	10.19	676.96
	LF6MW10	SEPT. 12. 1993	687.15	692.91	17.69	675.31
SITE 8	HN8MW1	SEPT. 12. 1993	693	693.47	17.62	676.03
	HN8MW2	SEPT. 12. 1993	693.65	693.84	17.75	676
	HN8MW3	SEPT. 12. 1993	693.75	687.49	11.37	676.12
	HN8MW4	SEPT. 12. 1993		690.79	17.94	673.06
	HN8MW5	SEPT. 12. 1993	691	692.63	24.64	668.21
	HN8MW5	SEPT. 12. 1993	692.85	685.22	14.78	670.72
SITE 9	RT9MW1	SEPT. 12. 1993	685.5	687.52	20.6	667.17
	RT9MW2	SEPT. 12. 1993	687.77	687.61	21.08	666.77
	RT9MW3	SEPT. 12. 1993	687.85	685	14.42	670.58
	RT9MW4	SEPT. 12. 1993		685		
	RT9MW5	SEPT. 12. 1993		685		
	RT9MW6	SEPT. 12. 1993		685		
LOCATION	ID	DATE	BENCH MARK		MEASUREMENT	SURFACE WATER ELEVATION
SINKHOLE	SPRING 1	SEPT 13. 1993		651.31		651.2
SINKHOLE	SPRING 2	SEPT 13. 1993		651.31		651.1
SINKHOLE	SPRING 3	SEPT 13. 1993		651.31		648.7
SINKHOLE	SPRING 4	SEPT 13. 1993		651.31		651.5
SINKHOLE	SPRING 5	SEPT 13. 1993		651.31		652.5
SINKHOLE	SPRING 6	SEPT 13. 1993		651.31		649.7
XTRM NORT	Gauge 3	AUG. 1993		674.18	2.58	671.6
NORTH	Gauge 2	AUG. 1993		676.14	4.58	671.56
LANDFILL 6	Gauge 4	AUG. 1993		675.04	3.57	671.47
BY SITE 1	Gauge 5	AUG. 1993		674.72	3.3	671.42
SINKHOLE	Gauge 1	AUG. 1993		649.95	3.25	646.7

Note: TOP OF PRO CASING is from November 1987 survey data.  
TOP OF PVC RISER is from August 1993 survey data.

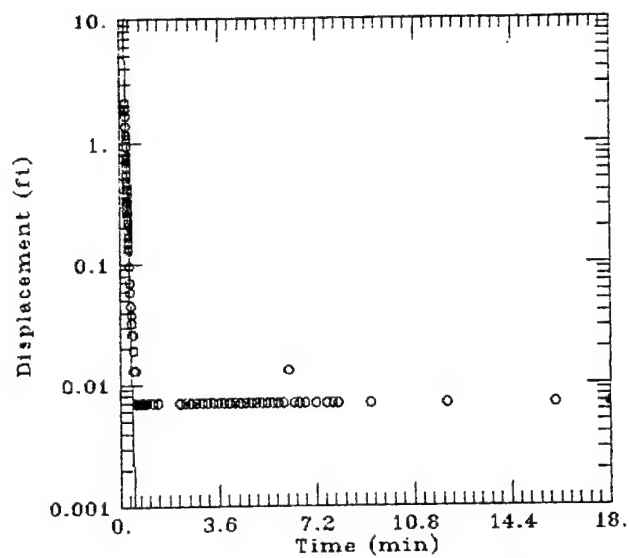


## **Aquifer Testing Results**





# 2mw6 / Alpena, MI



## DATA SET:

2mw6.d81  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Huwer-Hice

## ESTIMATED PARAMETERS:

$K = 0.01472$  ft/min  
 $y_0 = 427.2$  ft

## TEST DATA:

$H_0 = 1.9$  ft  
 $r_c = 0.083$  ft  
 $r_w = 0.343$  ft  
 $L = 15$  ft  
 $b = 30$  ft  
 $H = 19$  ft

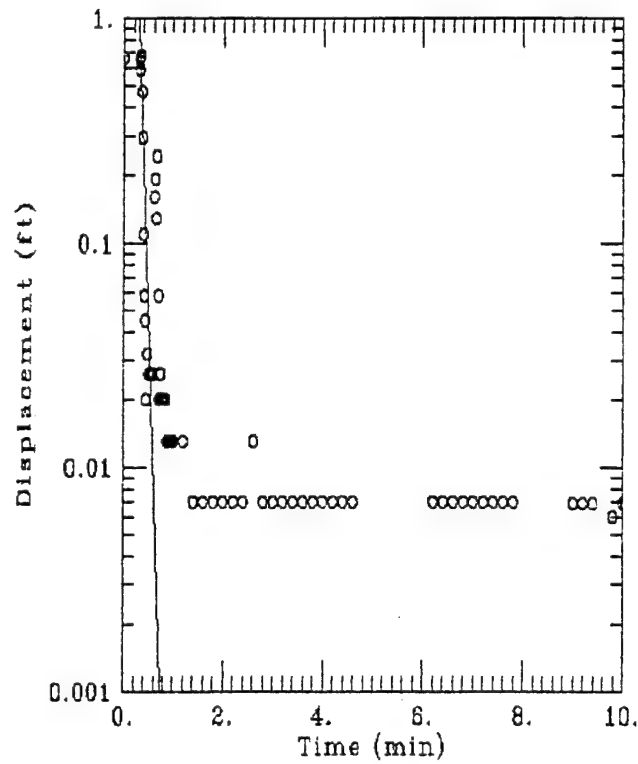
SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.2233	2.118	1
0.2266	1.87	1
0.23	1.659	1
0.2333	1.366	1
0.25	1.168	1
0.2533	1.085	1
0.2566	0.944	1
0.26	0.804001	1
0.2633	0.771999	1
0.2666	0.696001	1
0.27	0.625	1
0.2733	0.549	1
0.2766	0.485	1
0.28	0.447	1
0.2833	0.408001	1
0.2866	0.370001	1
0.29	0.332001	1
0.2933	0.306	1
0.2966	0.281	1
0.3	0.254999	1
0.3033	0.236	1
0.3066	0.217001	1
0.31	0.204	1
0.3133	0.191999	1
0.3166	0.179001	1
0.32	0.166	1
0.3233	0.153	1
0.3266	0.146999	1
0.33	0.134001	1
0.3333	0.128	1
0.35	0.0960006	1
0.3666	0.0699996	1
0.3833	0.0580005	1
0.4	0.045	1
0.4166	0.038	1
0.4333	0.0319995	1
0.45	0.0260009	1
0.4666	0.0260009	1
0.4833	0.0190009	1
0.5	0.0190009	1
0.5166	0.0130004	1
0.5333	0.0130004	1
0.55	0.0130004	1
0.5666	0.0130004	1
0.5833	0.00699986	1
0.6	0.00699986	1
0.6166	0.00699986	1
0.6333	0.00699986	1
0.65	0.00699986	1
0.6666	0.00699986	1
0.6833	0.00699986	1
0.7	0.00699986	1

SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
0.7166	0.00699986	1
0.7333	0.00699986	1
0.75	0.00699986	1
0.7666	0.00699986	1
0.7833	0.00699986	1
0.8	0.00699986	1
0.8166	0.00699986	1
0.8333	0.00699986	1
0.85	0.00699986	1
0.8666	0.00699986	1
0.8833	0.00699986	1
0.9	0.00699986	1
0.9166	0.00699986	1
0.9333	0.00699986	1
0.95	0.00699986	1
0.9666	0.00699986	1
0.9833	0.00699986	1
1	0.00699986	1
1.2	0.00699986	1
1.4	0.00699986	1
2.2	0.00699986	1
2.4	0.00699986	1
2.6	0.00699986	1
2.8	0.00699986	1
3	0.00699986	1
3.2	0.00699986	1
3.4	0.00699986	1
3.6	0.00699986	1
3.8	0.00699986	1
4	0.00699986	1
4.2	0.00699986	1
4.4	0.00699986	1
4.6	0.00699986	1
4.8	0.00699986	1
5	0.00699986	1
5.2	0.00699986	1
5.4	0.00699986	1
5.6	0.00699986	1
5.8	0.00699986	1
6	0.00699986	1
6.2	0.0130004	1
6.4	0.00699986	1
6.6	0.00699986	1
6.8	0.00699986	1
7.2	0.00699986	1
7.6	0.00699986	1
7.8	0.00699986	1
8	0.00699986	1
9.2	0.00699986	1
12	0.00699986	1
16	0.00699986	1
18	0.00699986	1

# 2mw6a / Alpena, MI



## DATA SET:

2mw6a.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bower-Rice

## ESTIMATED PARAMETERS:

$K = 0.01021$  ft/min  
 $y_0 = 147.2$  ft

## TEST DATA:

$H_0 = 0.664$  ft  
 $r_c = 0.083$  ft  
 $r_w = 0.343$  ft  
 $L = 15$  ft  
 $b = 30$  ft  
 $H = 21$  ft



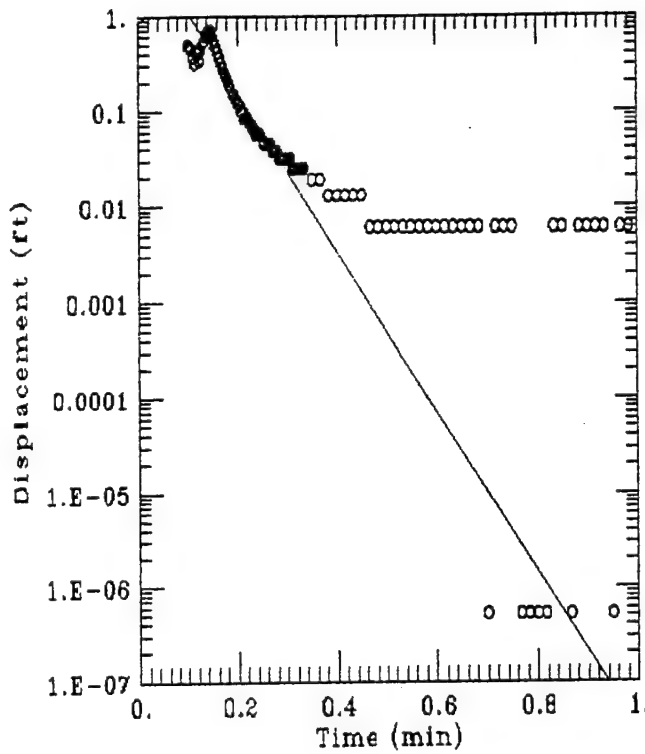
SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.3266	0.664	1
0.33	0.638	1
0.3333	0.587	1
0.35	0.677	1
0.3666	0.473	1
0.3833	0.294001	1
0.4	0.108999	1
0.4166	0.0580006	1
0.4333	0.0450001	1
0.45	0.0200005	1
0.4666	0.0319996	1
0.4833	0.0319996	1
0.5	0.0259991	1
0.5166	0.0259991	1
0.5333	0.0259991	1
0.55	0.0259991	1
0.5666	0.0259991	1
0.5833	0.0259991	1
0.6	0.0259991	1
0.6166	0.16	1
0.6333	0.191999	1
0.65	0.128	1
0.6666	0.243	1
0.6833	-0.0310001	1
0.7	0.0580006	1
0.7166	0.0200005	1
0.7333	0.0259991	1
0.75	0.0259991	1
0.7666	0.0200005	1
0.7833	0.0200005	1
0.8	0.0200005	1
0.8166	0.0200005	1
0.8333	0.0200005	1
0.85	0.0200005	1
0.8666	0.0130005	1
0.8833	0.0130005	1
0.9	0.0130005	1
0.9166	0.0130005	1
0.9333	0.0130005	1
0.95	0.0130005	1
0.9666	0.0130005	1
0.9833	0.0130005	1
1	0.0130005	1
1.2	0.0130005	1
1.4	0.00699997	1
1.6	0.00699997	1
1.8	0.00699997	1
2	0.00699997	1
2.2	0.00699997	1
2.4	0.00699997	1
2.6	0.0130005	1
2.8	0.00699997	1

SITE 2 MONITORING WELL #6 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
3	0.00699997	1
3.2	0.00699997	1
3.4	0.00699997	1
3.6	0.00699997	1
3.8	0.00699997	1
4	0.00699997	1
4.2	0.00699997	1
4.4	0.00699997	1
4.6	0.00699997	1
6.2	0.00699997	1
6.4	0.00699997	1
6.6	0.00699997	1
6.8	0.00699997	1
7	0.00699997	1
7.2	0.00699997	1
7.4	0.00699997	1
7.6	0.00699997	1
7.8	0.00699997	1
9	0.00699997	1
9.2	0.00699997	1
9.4	0.00699997	1
9.8	0.00699997	1
10	0.00699997	1

# 2mw6b / Alpena, MI



## DATA SET:

2mw6b.dat

10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bower-Rice

## ESTIMATED PARAMETERS:

$K = 0.01179$  ft/min

$yD = 7.499$  ft

## TEST DATA:

$HU = 1$  ft

$rc = 0.083$  ft

$rw = 0.343$  ft

$L = 15$  ft

$b = 30$  ft

$H = 19$  ft

SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1	0.484999	1
0.1033	0.472001	1
0.1066	0.446999	1
0.11	0.376	1
0.1133	0.319001	1
0.1166	0.427001	1
0.12	0.402001	1
0.1233	0.338	1
0.1266	0.434001	1
0.13	0.510001	1
0.1333	0.542	1
0.1366	0.612	1
0.14	0.644	1
0.1433	0.689	1
0.1466	0.689	1
0.15	0.644	1
0.1533	0.560999	1
0.1566	0.484999	1
0.16	0.415	1
0.1633	0.364001	1
0.1666	0.319001	1
0.17	0.286999	1
0.1733	0.255	1
0.1766	0.23	1
0.18	0.210999	1
0.1833	0.191001	1
0.1866	0.171999	1
0.19	0.153	1
0.1933	0.147	1
0.1966	0.133999	1
0.2	0.121001	1
0.2033	0.115	1
0.2066	0.102	1
0.21	0.0959993	1
0.2133	0.0830007	1
0.2166	0.0830007	1
0.22	0.0830007	1
0.2233	0.0760007	1
0.2266	0.0700002	1
0.23	0.0700002	1
0.2333	0.0639997	1
0.2366	0.0569997	1
0.24	0.0569997	1
0.2433	0.0569997	1
0.2466	0.0569997	1
0.25	0.0509992	1
0.2533	0.0450006	1
0.2566	0.0450006	1
0.26	0.0450006	1
0.2633	0.0450006	1
0.2666	0.0450006	1
0.27	0.0380006	1

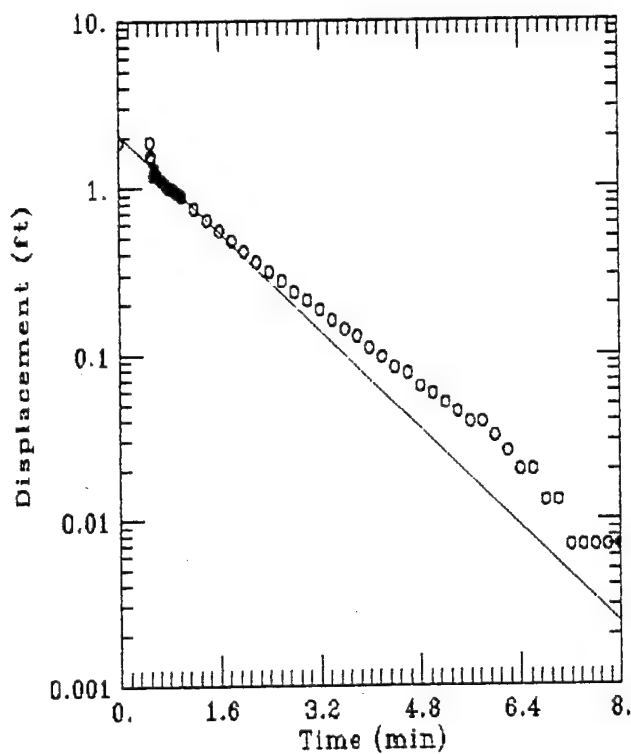
SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
0.2733	0.0380006	1
0.2766	0.0380006	1
0.28	0.0380006	1
0.2833	0.0320001	1
0.2866	0.0320001	1
0.29	0.0320001	1
0.2933	0.0320001	1
0.2966	0.0320001	1
0.3	0.0320001	1
0.3033	0.0320001	1
0.3066	0.0320001	1
0.31	0.0250001	1
0.3133	0.0250001	1
0.3166	0.0250001	1
0.32	0.0250001	1
0.3233	0.0250001	1
0.3266	0.0250001	1
0.33	0.0250001	1
0.3333	0.0250001	1
0.35	0.0189996	1
0.3666	0.0189996	1
0.3833	0.0129991	1
0.4	0.0129991	1
0.4166	0.0129991	1
0.4333	0.0129991	1
0.45	0.0129991	1
0.4666	0.00599913	1
0.4833	0.00599913	1
0.5	0.00599913	1
0.5166	0.00599913	1
0.5333	0.00599913	1
0.55	0.00599913	1
0.5666	0.00599913	1
0.5833	0.00599913	1
0.6	0.00599913	1
0.6166	0.00599913	1
0.6333	0.00599913	1
0.65	0.00599913	1
0.6666	0.00599913	1
0.6833	0.00599913	1
0.7166	0.00599913	1
0.7333	0.00599913	1
0.75	0.00599913	1
0.8333	0.00599913	1
0.85	0.00599913	1
0.8833	0.00599913	1
0.9	0.00599913	1
0.9166	0.00599913	1
0.9333	0.00599913	1
0.9666	0.00599913	1
0.9833	0.00599913	1
1	0.00599913	1

SITE 2 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
2	-0.006	1
2.2	-0.006	1
2.4	-0.006	1
2.6	-0.006	1
2.8	-0.006	1
3	-0.006	1
3.2	-0.006	1
3.4	-0.006	1
3.6	-0.006	1
3.8	-0.006	1
4	-0.006	1
4.2	-0.006	1
4.4	-0.006	1
4.6	-0.006	1
4.8	-0.006	1
5	-0.006	1
5.2	-0.006	1
5.4	-0.006	1
5.6	-0.006	1
5.8	-0.006	1
6	-0.006	1
6.6	-0.006	1
6.8	-0.006	1
7	-0.006	1

# 6mw6in / Alpena, MI



## DATA SET:

6mw6in.dat

10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowmer Rice

## ESTIMATED PARAMETERS:

$K = 0.0005844$  ft/min

$y_D = 2.078$  ft

## TEST DATA:

$HU = 1.8$  ft

$rc = 0.083$  ft

$rw = 0.343$  ft

$L = 10$  ft

$b = 33$  ft

$h = 15$  ft

SITE 6 MONITORING WELL #6 (SLUG IN)

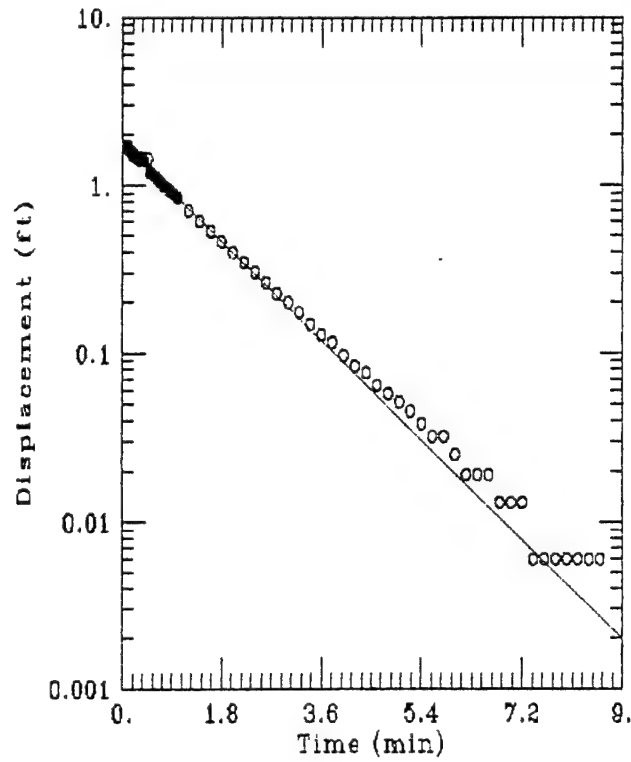
TIME (min)	DRAWDOWN (ft)	WEIGHT
0.5	1.87	1
0.5166	1.544	1
0.5333	1.474	1
0.55	1.193	1
0.5666	1.225	1
0.5833	1.276	1
0.6	1.213	1
0.6166	1.181	1
0.6333	1.162	1
0.65	1.136	1
0.6666	1.123	1
0.6833	1.104	1
0.7	1.091	1
0.7166	1.079	1
0.7333	1.059	1
0.75	1.04	1
0.7666	1.021	1
0.7833	1.002	1
0.8	0.989	1
0.8166	0.989	1
0.8333	0.983	1
0.85	0.983	1
0.8666	0.969999	1
0.8833	0.964001	1
0.9	0.951	1
0.9166	0.938	1
0.9333	0.924999	1
0.95	0.919001	1
0.9666	0.906	1
0.9833	0.893999	1
1	0.881001	1
1.2	0.747	1
1.4	0.638	1
1.6	0.549	1
1.8	0.479	1
2	0.415001	1
2.2	0.358	1
2.4	0.313	1
2.6	0.275	1
2.8	0.236	1
3	0.211	1
3.2	0.184999	1
3.4	0.16	1
3.6	0.141001	1
3.8	0.128	1
4	0.108999	1
4.2	0.0960007	1
4.4	0.0830002	1
4.6	0.0769997	1
4.8	0.0639992	1
5	0.0580006	1
5.2	0.0510006	1



SITE 6 MONITORING WELL #6 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
5.4	0.0450001	1
5.6	0.0389996	1
5.8	0.0389996	1
6	0.0319996	1
6.2	0.0259991	1
6.4	0.0200005	1
6.6	0.0200005	1
6.8	0.0130005	1
7	0.0130005	1
7.2	0.00699997	1
7.4	0.00699997	1
7.6	0.00699997	1
7.8	0.00699997	1
8	0.00699997	1

# 6mw6out / Alpena, MI



## DATA SET:

6mw6out.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser-Rice

## ESTIMATED PARAMETERS:

$K = 0.0006085$  ft/min  
 $\gamma_0 = 1.78$  ft

## TEST DATA:

$H_0 = 1.703$  ft  
 $r_c = 0.083$  ft  
 $r_w = 0.343$  ft  
 $L = 10$  ft  
 $b = 33$  ft  
 $H = 15$  ft

SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1	1.703	1
0.1033	1.652	1
0.1066	1.652	1
0.11	1.652	1
0.1133	1.639	1
0.1166	1.627	1
0.12	1.627	1
0.1233	1.62	1
0.1266	1.614	1
0.13	1.607	1
0.1333	1.601	1
0.1366	1.595	1
0.14	1.588	1
0.1433	1.588	1
0.1466	1.588	1
0.15	1.582	1
0.1533	1.582	1
0.1566	1.582	1
0.16	1.569	1
0.1633	1.576	1
0.1666	1.576	1
0.17	1.576	1
0.1733	1.525	1
0.1766	1.531	1
0.18	1.518	1
0.1833	1.505	1
0.1866	1.525	1
0.19	1.531	1
0.1933	1.531	1
0.1966	1.525	1
0.2	1.531	1
0.2033	1.531	1
0.2066	1.512	1
0.21	1.512	1
0.2133	1.518	1
0.2166	1.512	1
0.22	1.512	1
0.2233	1.512	1
0.2266	1.499	1
0.23	1.486	1
0.2333	1.48	1
0.2366	1.48	1
0.24	1.473	1
0.2433	1.467	1
0.2466	1.461	1
0.25	1.467	1
0.2533	1.461	1
0.2566	1.454	1
0.26	1.454	1
0.2633	1.448	1
0.2666	1.448	1
0.27	1.442	1

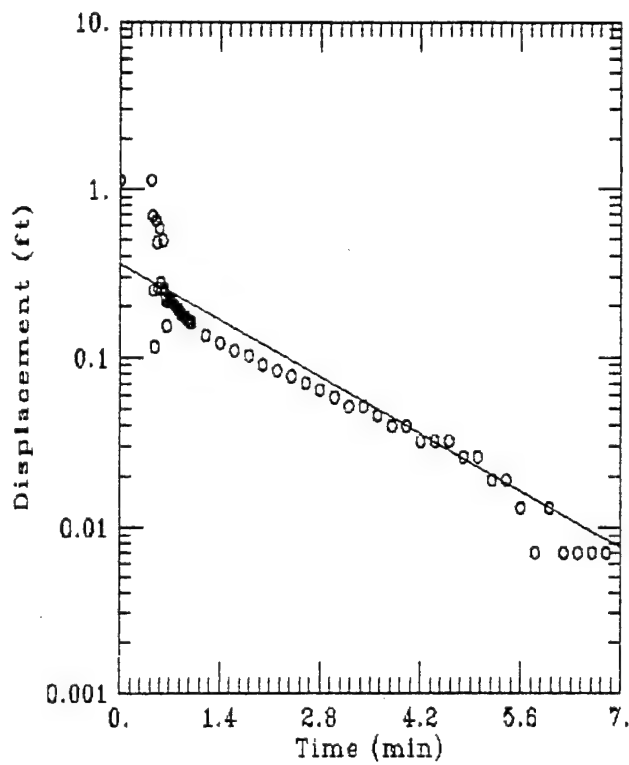
SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.2733	1.442	1
0.2766	1.435	1
0.28	1.435	1
0.2833	1.435	1
0.2866	1.429	1
0.29	1.429	1
0.2933	1.429	1
0.2966	1.429	1
0.3	1.429	1
0.3033	1.422	1
0.3066	1.41	1
0.31	1.435	1
0.3133	1.422	1
0.3166	1.422	1
0.32	1.429	1
0.3233	1.422	1
0.3266	1.435	1
0.33	1.435	1
0.3333	1.448	1
0.35	1.422	1
0.3666	1.422	1
0.3833	1.416	1
0.4666	1.435	1
0.4833	1.199	1
0.5	1.193	1
0.5166	1.18	1
0.5333	1.167	1
0.55	1.148	1
0.5666	1.135	1
0.5833	1.123	1
0.6	1.11	1
0.6166	1.097	1
0.6333	1.084	1
0.65	1.072	1
0.6666	1.059	1
0.6833	1.046	1
0.7	1.033	1
0.7166	1.021	1
0.7333	1.008	1
0.75	0.995	1
0.7666	0.989	1
0.7833	0.976	1
0.8	0.963	1
0.8166	0.95	1
0.8333	0.944	1
0.85	0.931	1
0.8666	0.918	1
0.8833	0.912	1
0.9	0.899	1
0.9166	0.887	1
0.9333	0.88	1
0.95	0.867	1

SITE 6 MONITORING WELL #6 (SLUG OUT)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.9666	0.855	1
0.9833	0.848	1
1	0.842	1
1.2	0.702	1
1.4	0.606	1
1.6	0.529	1
1.8	0.459	1
2	0.395	1
2.2	0.344	1
2.4	0.3	1
2.6	0.261	1
2.8	0.223	1
3	0.198	1
3.2	0.172	1
3.4	0.147	1
3.6	0.127	1
3.8	0.115	1
4	0.0960002	1
4.2	0.0829997	1
4.4	0.0759997	1
4.6	0.0639996	1
4.8	0.0569997	1
5	0.0510001	1
5.2	0.0449996	1
5.4	0.0379996	1
5.6	0.032	1
5.8	0.032	1
6	0.0250001	1
6.2	0.0189996	1
6.4	0.0189996	1
6.6	0.0189996	1
6.8	0.013	1
7	0.013	1
7.2	0.013	1
7.4	0.00600002	1
7.6	0.00600002	1
7.8	0.00600002	1
8	0.00600002	1
8.2	0.00600002	1
8.4	0.00600002	1
8.6	0.00600002	1

# 6mw4 / Alpena, MI



## DATA SET:

6mw4.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowser-Rice

## ESTIMATED PARAMETERS:

$K = 0.0003813$  ft/min  
 $yD = 0.3565$  ft

## TEST DATA:

$HU = 1.129$  ft  
 $rc = 0.083$  ft  
 $rw = 0.343$  ft  
 $L = 10.$  ft  
 $b = 20.$  ft  
 $H = 7.$  ft

SITE 6 MONITORING WELL #4 (SLUG IN)

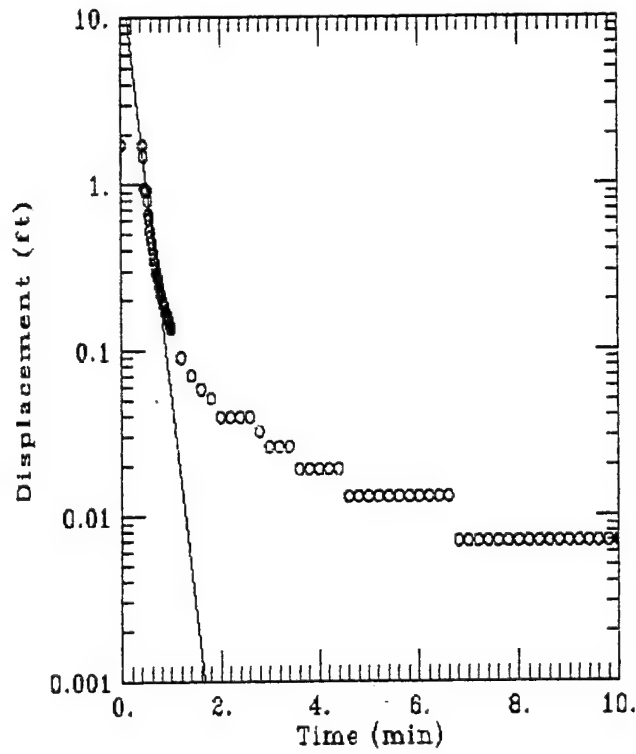
TIME (min)	DRAWDOWN (ft)	WEIGHT
0.4333	1.129	1
0.45	0.689	1
0.4666	0.249	1
0.4833	0.115001	1
0.5	0.644999	1
0.5166	0.478999	1
0.5333	0.255	1
0.55	0.581	1
0.5666	0.275001	1
0.5833	0.249	1
0.6	0.492	1
0.6166	0.255	1
0.6333	0.217	1
0.65	0.153001	1
0.6666	0.210999	1
0.6833	0.224	1
0.7	0.217	1
0.7166	0.210999	1
0.7333	0.210999	1
0.75	0.203999	1
0.7666	0.198001	1
0.7833	0.198001	1
0.8	0.192	1
0.8166	0.192	1
0.8333	0.185	1
0.85	0.179	1
0.8666	0.179	1
0.8833	0.172999	1
0.9	0.172999	1
0.9166	0.172999	1
0.9333	0.165999	1
0.95	0.165999	1
0.9666	0.160001	1
0.9833	0.160001	1
1	0.160001	1
1.2	0.134	1
1.4	0.120999	1
1.6	0.109	1
1.8	0.102	1
2	0.0899991	1
2.2	0.0829992	1
2.4	0.0770006	1
2.6	0.0700006	1
2.8	0.0640001	1
3	0.0579996	1
3.2	0.0509996	1
3.4	0.0509996	1
3.6	0.0449991	1
3.8	0.0390005	1
4	0.0390005	1
4.2	0.0320005	1
4.4	0.0320005	1

SITE 6 MONITORING WELL #4 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
4.6	0.0320005	1
4.8	0.026	1
5	0.026	1
5.2	0.019	1
5.4	0.019	1
5.6	0.0129995	1
5.8	0.00700087	1
6	0.0129995	1
6.2	0.00700087	1
6.4	0.00700087	1
6.6	0.00700087	1
6.8	0.00700087	1



# 5mw5 / Alpena, MI



## DATA SET:

5mw5.dat  
10/13/93

## AQUIFER TYPE:

Unconfined

## SOLUTION METHOD:

Bowen Rice

## ESTIMATED PARAMETERS:

$K = 0.004464$  ft/min  
 $y_0 = 19.39$  ft

## TEST DATA:

$HU = 1.723$  ft  
 $rc = 0.083$  ft  
 $rw = 0.343$  ft  
 $L = 10.$  ft  
 $b = 15.$  ft  
 $H = 9.$  ft

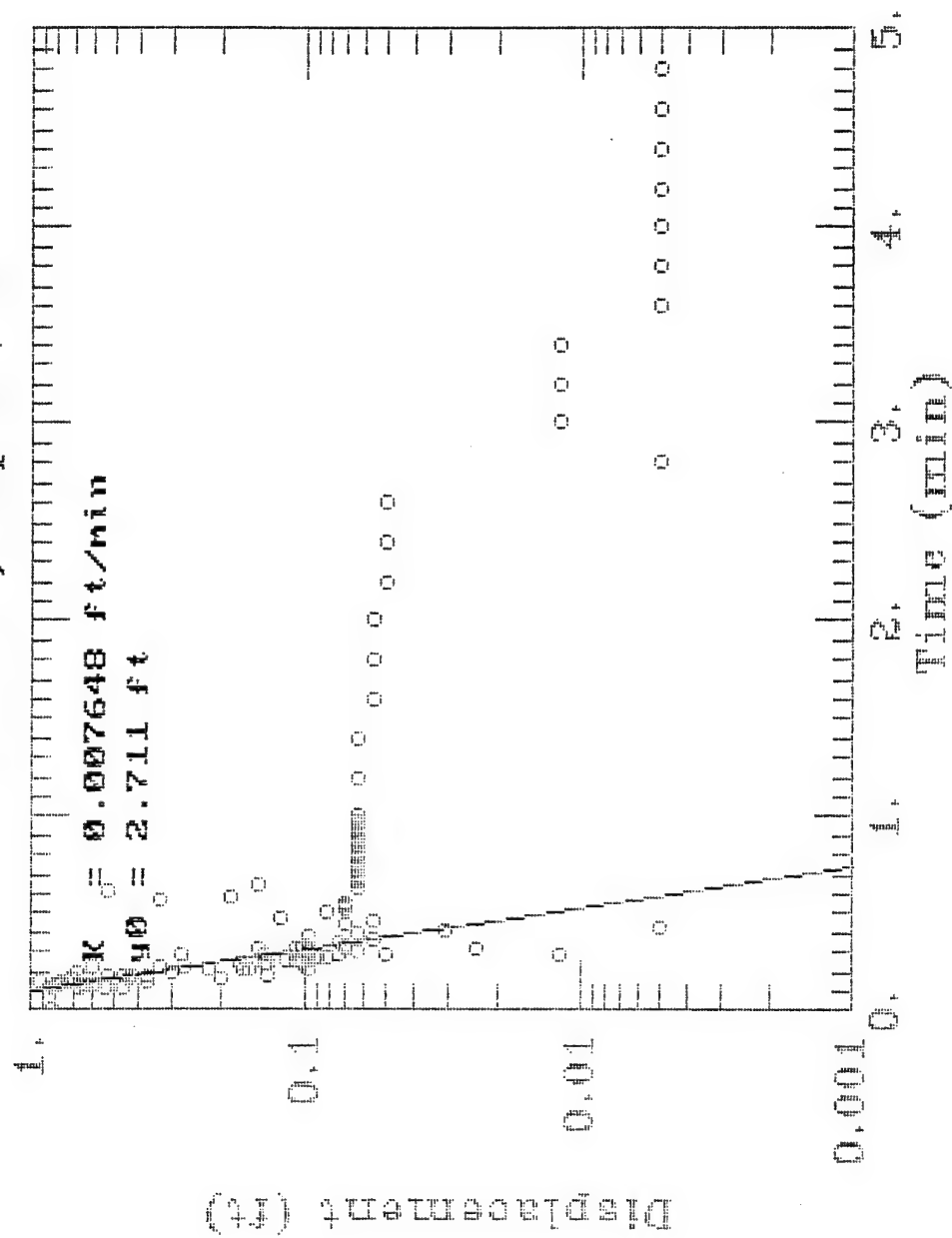
SITE 5 MONITORING WELL #5 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.4333	1.723	1
0.45	1.48	1
0.4666	0.944	1
0.5	0.9	1
0.5166	0.919	1
0.5333	0.798	1
0.55	0.657	1
0.5666	0.619	1
0.5833	0.523	1
0.6	0.485	1
0.6166	0.447	1
0.6333	0.415	1
0.65	0.383	1
0.6666	0.358	1
0.6833	0.332	1
0.7	0.307	1
0.7166	0.287	1
0.7333	0.275	1
0.75	0.256	1
0.7666	0.243	1
0.7833	0.23	1
0.8	0.217	1
0.8166	0.211	1
0.8333	0.198	1
0.85	0.192	1
0.8666	0.185	1
0.8833	0.173	1
0.9	0.166	1
0.9166	0.16	1
0.9333	0.16	1
0.95	0.153	1
0.9666	0.147	1
0.9833	0.141	1
1	0.134	1
1.2	0.0900001	1
1.4	0.0699996	1
1.6	0.0579996	1
1.8	0.0509996	1
2	0.0390005	1
2.2	0.0390005	1
2.4	0.0390005	1
2.6	0.0390005	1
2.8	0.0319995	1
3	0.026	1
3.2	0.026	1
3.4	0.026	1
3.6	0.019	1
3.8	0.019	1
4	0.019	1
4.2	0.019	1
4.4	0.019	1
4.6	0.0130004	1

SITE 5 MONITORING WELL #5 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
4.8	0.0130004	1
5	0.0130004	1
5.2	0.0130004	1
5.4	0.0130004	1
5.6	0.0130004	1
5.8	0.0130004	1
6	0.0130004	1
6.2	0.0130004	1
6.4	0.0130004	1
6.6	0.0130004	1
6.8	0.00699992	1
7	0.00699992	1
7.2	0.00699992	1
7.4	0.00699992	1
7.6	0.00699992	1
7.8	0.00699992	1
8	0.00699992	1
8.2	0.00699992	1
8.4	0.00699992	1
8.6	0.00699992	1
8.8	0.00699992	1
9	0.00699992	1
9.2	0.00699992	1
9.4	0.00699992	1
9.6	0.00699992	1
9.8	0.00699992	1
10	0.00699992	1

# 1mw3in / Alpena, MI



SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.1133	0.836	1
0.1166	0.65	1
0.12	0.453	1
0.1233	0.529	1
0.1266	0.644	1
0.13	0.784	1
0.1333	0.816	1
0.1366	0.631	1
0.14	0.58	1
0.1433	0.721	1
0.1466	0.925	1
0.15	0.759	1
0.1533	0.37	1
0.1566	0.708	1
0.16	0.619	1
0.1633	0.434	1
0.1666	0.198	1
0.17	0.689	1
0.1733	0.427	1
0.1766	0.517	1
0.18	0.453	1
0.1833	0.134	1
0.1866	0.376	1
0.19	0.67	1
0.1933	-0.0700003	1
0.1966	-0.192	1
0.2	0.306	1
0.2033	0.223	1
0.2066	-0.504	1
0.21	0.166	1
0.2133	0.096	1
0.2166	0.159	1
0.22	0.338	1
0.2233	0.599	1
0.2266	0.274	1
0.23	-0.0379998	1
0.2333	-0.0069996	1
0.2366	0.14	1
0.24	0.172	1
0.2433	0.134	1
0.2466	0.102	1
0.25	0.108	1
0.2533	0.115	1
0.2566	0.108	1
0.26	0.102	1
0.2633	0.096	1
0.2666	0.0890001	1
0.27	0.096	1
0.2733	0.096	1
0.2766	0.0829996	1
0.28	0.0829996	1
0.2833	0.14	1

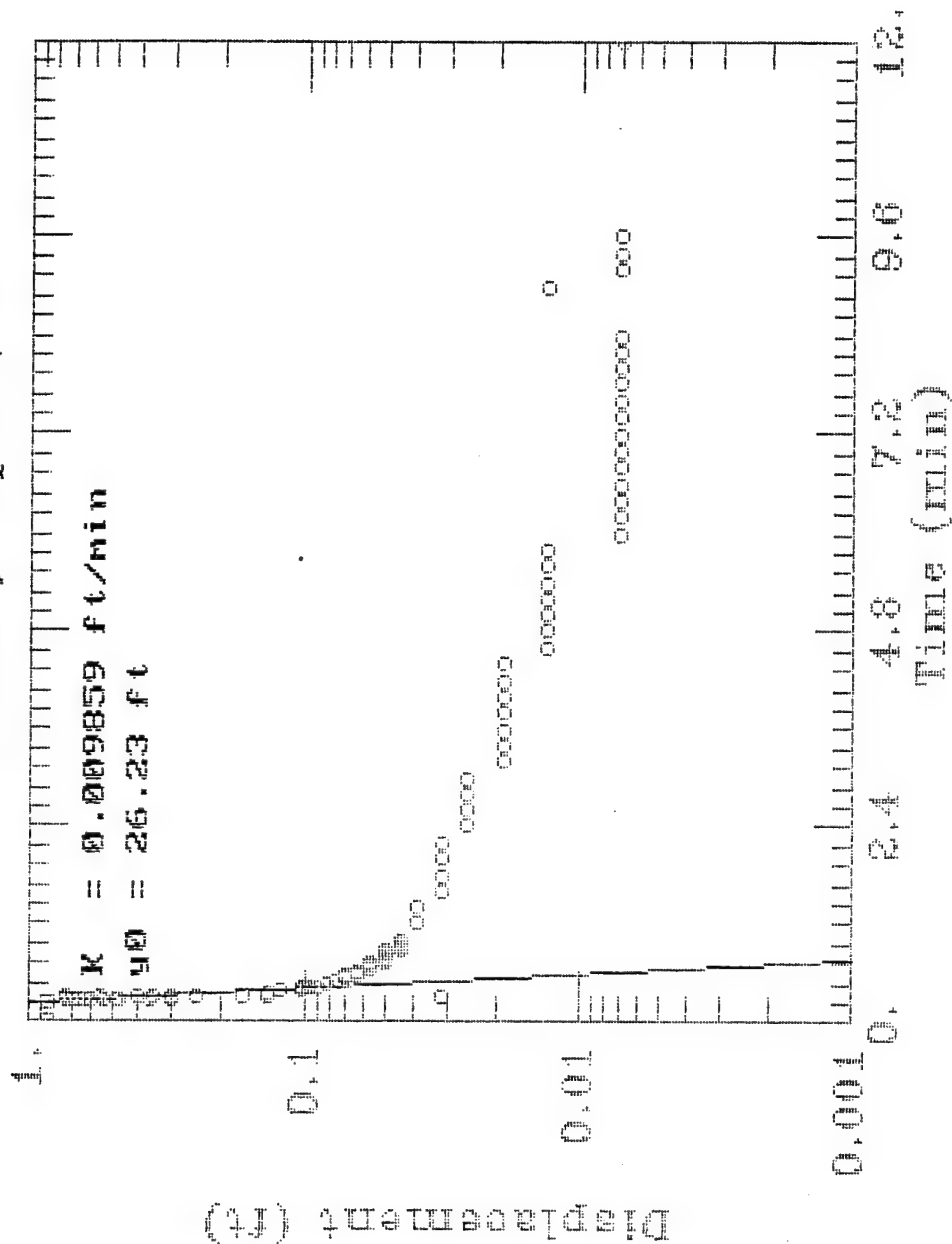
SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.2866	0.281	1
0.29	0.051	1
0.2933	0.0759996	1
0.2966	0.0129999	1
0.3	0.0640005	1
0.3033	0.096	1
0.3066	0.0640005	1
0.31	0.096	1
0.3133	0.102	1
0.3166	0.07	1
0.32	0.147	1
0.3233	0.108	1
0.3266	0.0249999	1
0.33	0.07	1
0.3333	0.096	1
0.35	0.0759996	1
0.3666	0.0569995	1
0.3833	0.096	1
0.4	0.0640005	1
0.4166	0.0319999	1
0.4333	0.00599989	1
0.45	0.07	1
0.4666	0.0569995	1
0.4833	0.121	1
0.5	0.0829996	1
0.5166	0.0759996	1
0.5333	0.07	1
0.55	0.07	1
0.5666	0.338	1
0.5833	0.185	1
0.6	-0.115	1
0.6166	0.523	1
0.6333	0.0640005	1
0.65	0.147	1
0.6666	0.0640005	1
0.6833	0.0640005	1
0.7	0.0640005	1
0.7166	0.0640005	1
0.7333	0.0640005	1
0.75	0.0640005	1
0.7666	0.0640005	1
0.7833	0.0640005	1
0.8	0.0640005	1
0.8166	0.0640005	1
0.8333	0.0640005	1
0.85	0.0640005	1
0.8666	0.0640005	1
0.8833	0.0640005	1
0.9	0.0640005	1
0.9166	0.0640005	1
0.9333	0.0640005	1
0.95	0.0640005	1

SITE 1 MONITORING WELL #3 (SLUG IN)

TIME (min)	DRAWDOWN (Ft)	WEIGHT
0.9666	0.0640005	1
0.9833	0.0640005	1
1	0.0640005	1
1.2	0.0640005	1
1.4	0.0640005	1
1.6	0.0569995	1
1.8	0.0569995	1
2	0.0569995	1
2.2	0.051	1
2.4	0.051	1
2.6	0.051	1
2.8	0.00599989	1
3	0.0129999	1
3.2	0.0129999	1
3.4	0.0129999	1
3.6	0.00599989	1
3.8	0.00599989	1
4	0.00599989	1
4.2	0.00599989	1
4.4	0.00599989	1
4.6	0.00599989	1
4.8	0.00599989	1
6.2	-0.0059996	1
6.4	-0.0069996	1
6.6	-0.0069996	1
6.8	-0.0069996	1
7	-0.0069996	1
7.2	-0.0069996	1
7.4	-0.0069996	1
7.6	-0.0069996	1
7.8	-0.0069996	1
8	-0.0069996	1
8.2	-0.0069996	1

# 1mw2in / Alpena, MI





SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.26	0.849	1
0.2633	0.728	1
0.2666	0.472	1
0.27	0.594	1
0.2733	0.632	1
0.2766	0.728	1
0.28	0.651	1
0.2833	0.696	1
0.2866	0.536	1
0.29	0.364	1
0.2933	0.479	1
0.2966	0.3	1
0.3	0.555	1
0.3033	-0.166	1
0.3066	0.249	1
0.31	0.0319995	1
0.3133	0.134	1
0.3166	0.351	1
0.32	0.3	1
0.3233	0.721	1
0.3266	0.402	1
0.33	-0.108	1
0.3333	0.166	1
0.35	-0.0889998	1
0.3666	0.134	1
0.3833	0.121	1
0.4	0.102	1
0.4166	0.102	1
0.4333	0.0959997	1
0.45	0.0900001	1
0.4666	0.0830001	1
0.4833	0.0830001	1
0.5	0.0769996	1
0.5166	0.0769996	1
0.5333	0.0699996	1
0.55	0.0699996	1
0.5666	0.0699996	1
0.5833	0.0640001	1
0.6	0.0640001	1
0.6166	0.0640001	1
0.6333	0.0640001	1
0.65	0.0579996	1
0.6666	0.0579996	1
0.6833	0.0579996	1
0.7	0.0579996	1
0.7166	0.0579996	1
0.7333	0.0579996	1
0.75	0.0509996	1
0.7666	0.0509996	1
0.7833	0.0509996	1
0.8	0.0509996	1
0.8166	0.0509996	1

SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (min)	DRAWDOWN (ft)	WEIGHT
0.8333	0.0509996	1
0.85	0.0509996	1
0.8666	0.045	1
0.8833	0.0509996	1
0.9	0.045	1
0.9166	0.045	1
0.9333	0.045	1
0.95	0.045	1
0.9666	0.045	1
0.9833	0.045	1
1	0.045	1
1.2	0.0390005	1
1.4	0.0390005	1
1.6	0.0319995	1
1.8	0.0319995	1
2	0.0319995	1
2.2	0.0319995	1
2.4	0.026	1
2.6	0.026	1
2.8	0.026	1
3	0.026	1
3.2	0.019	1
3.4	0.019	1
3.6	0.019	1
3.8	0.019	1
4	0.019	1
4.2	0.019	1
4.4	0.019	1
4.6	0.0130004	1
4.8	0.0130004	1
5	0.0130004	1
5.2	0.0130004	1
5.4	0.0130004	1
5.6	0.0130004	1
5.8	0.0130004	1
6	0.00699992	1
6.2	0.00699992	1
6.4	0.00699992	1
6.6	0.00699992	1
6.8	0.00699992	1
7	0.00699992	1
7.2	0.00699992	1
7.4	0.00699992	1
7.6	0.00699992	1
7.8	0.00699992	1
8	0.00699992	1
8.2	0.00699992	1
8.4	0.00699992	1
9	0.0130004	1
9.2	0.00699992	1
9.4	0.00699992	1
9.6	0.00699992	1

SITE 1 MONITORING WELL #2 (SLUG IN)

TIME (Min)	DRAWDOWN (ft)	WEIGHT
12	0.00699992	1



**Appendix C: Soil Boring Logs, Monitoring Well  
Construction Forms and Geotechnical Results**



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: PBG1

Sheet 1 of 1

Borehole Location: <b>Background--north side.</b>		Elevation and Datum (ft):		Ground: <b>Top of Casing:</b>	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/9/93</b>		Date Completed: <b>8/9/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: <b>12.0</b> Depth (ft)		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>4</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>11.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>This is a background borehole. Borehole abandoned with Hole Plug.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>P Lay</b>	

[illegible]

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **BG2**

Sheet **1** of **1**

Borehole Location: <b>Background</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>2</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>2.5</b>	Water Depth Elev. (ft):		
Completion Information: <b>Grouted to surface with cement/bentonite slurry.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			13	0758	0/0				SAND; dark brown; organic rich; with fumes.  Grading to brown; to medium to coarse, well sorted qtz/RF sand.	Continuous split spoon samples.  WET at 2.5'.  No hydrocarbon odors noted.
			28	0803	0/0			SP		
5										TD = 4'.
10										
15										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


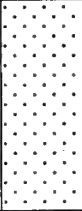

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB4

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>2.5</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole was abandoned with Hole Plug after sampling was complete.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			19	0809	0/0			SP	Topsoil for surfical 6 inches. SAND; orangeish brown; medium grained sand.	Collected double water sample volume for duplicate.
			32	0813					Grading to brown.	Collected double water sample volume for MS/MSD.
5										TD = 4'.
10										
15										
20										



# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/24/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/24/93</u>	
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total: Depth (ft)</b> <u>4.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
		<b>Number of Samples:</b>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Borehole abandoned with Hole Plug.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			46	0833	0/0			AF	Artificial fill; grey sand with gravel.	Uppermost foot is artificial fill.
			40	0836	0/0			SP	SAND; brownish orange; mostly medium grained sand. Grading to light grey.	
									Grading to orangeish brown.	
5										TD = 4'.
10										
15										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB6

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 1		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/24/93	<b>Date Completed:</b> 8/24/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 4.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 3.0	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Borehole abandoned with Hole Plug.		<b>Logged By:</b> D Jayne	<b>Checked By:</b> J Briegel

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			38	0848				AF	Artificial fill; grey sand with gravel.	TD = 4'.
			64	0854				SP	SAND; light grey; medium grained sand. Grading to light brown to grey.	
5										
10										
15										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI


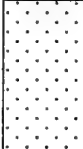
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1SB7

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft): <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			31	0905				AF	Artificial fill; grey sand with gravel.	Wet at 3'.  TD = 4'.
			48	0908				SP	SAND; light grey; medium grained.	
5										
10										
15										
20										
25										
30										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**



Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1SB8**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			18	0933				AF	Artificial fill; Dark brown topsoil.	Wet at about 3'.  TD = 4'.
			34	0935				SP	SAND; light brown; medium grained sand.	
									Grading to reddish brown.	
5										
10										
15										
20										
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										
80										
85										
90										
95										
100										

Wet at about 3'.  
TD = 4'.



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800Name of Borehole or Well: S1SB9

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>		Date Completed: <b>8/24/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

[illegible]



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: S1SB10

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

[illegible]

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI





**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1SB11

**Sheet** 1 **of** 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>3.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			62	1034				AF	Asphalt; 6 inches thick at surface. Artificial fill beneath asphalt.	No field screen.  Wet at about 3'.
			63	1038				SP	SAND; brown; medium grained sand. Grading to greyish. Grading back to brown sand.	
5										TD = 4'.
10										
								</		

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

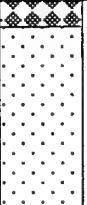
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1SB12**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>		Date Completed: <b>8/24/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>4.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>1.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned with Hole Plug.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
			13	1055			AF  SP	Artificial fill; topsoil for surficial 4 inches. SAND; greyish brown; medium grained sand.	Bohehole situated in ditch.  Wet at about 1.5'. Used only one SS sampler on this hole because water was so high.
5									
10									
15									
20									



## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1PZ1**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/23/93</b>		Date Completed: <b>8/23/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>0</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>4.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a piezometer. Abandoned 9/12/93 with Hole Plug. See piezometer construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5			80/0		SP		<p>SAND; light brown; medium grained; moist.</p> <p>Not sampled with split spoon.</p> <p>Auger cuttings noted to have hydrocarbon odor. PID reads 80ppm.</p> <p>Screened from 3' to 8'.</p> <p>Applied filter pack from 2' to 8'.</p>	
10							<p>TD = 8'.</p>	
15								

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1PZ2

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Top of Casing:</b>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Started:</b> <u>8/23/93</u>	<b>Date Completed:</b> <u>8/23/93</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Number of Samples:</b> <u>0</u>	<b>Dist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>Completed as a piezometer. Abandoned 9/12/93 with Hole Plug. See piezometer construction log.</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
5				60/0			SP	SAND; light brown; medium grained.	Not sampled with split spoons.  Hydrocarbon odors noted on cuttings. PID reads 60 ppm.
10									
15									
20									

TD = 8'.

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1PZ3

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/23/93</u>	<b>Date Completed:</b> <u>8/23/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a piezometer. Abandoned 12 Sep 93 with Hole Plug. See piezometer construction log.</u>		<b>Logged By:</b> <p style="text-align: center;"><b>D Jayne</b></p>	<b>Checked By:</b> <p style="text-align: center;"><b>J Briegel</b></p>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
								Asphalt pavement at surface; 6" thick.	
								SAND; light brown; medium grained.	No split spoon samples taken.
5							SP		No hydrocarbon odors noted from cuttings. No readings on PID.
									Field screen sample collected 8/24/93 with bailer: P1PZ3.
10									TD = 8'.
15									
20									

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW1**

Sheet **1** of **2**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/24/93</b>	Date Completed: <b>8/24/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>40</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.5</b>		Water Depth Elev.(ft):	
Completion Information: <b>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/B*	FTD (ppm) S/B*	Graphic Symbol	USCS		
	7		1353		.5/0			Topsoil: SAND; dark brown; with roots and other organic material surficial 4".		
	20		1357		0/01			Change to greyish brown and reddish brown; to without organic debris; to well-graded SAND.		
	9		1401		0/0			SAND; brownish grey; with fine to medium sand.		Water at about 2.5 feet BGL.
5			1420							
	8		1422		.5/0			Same as above.		Hydropunch sample taken from 6'-8' level.
10			1425		.7/0			SANDY CLAY; grey; 85% hard, plastic clay; with sand.		
	10		1429		.1/0			SAND; reddish brown; fine to medium sand.		
	4		1433		0/0			CLAY; grey; hard, plastic clay; with trace of fine to medium sand.		
15			1435		0/0			Grading to with less sand.		
	14		1455		0/0			SANDY CLAY; grey; 80% plastic clay; 20% sand.		Hydropunch sample taken from 16'-18' level.
20			1459		0/0			SAND; grey; with fine to medium sand.		
	31		1503		0/0			Same as above, with 1" clayey layer.		
25			1511		0/0			Same as above, with two 1" clay layers.		
	46		1515		0/0			Grading to mostly fine sand.		
	51		1518		0/0			Grading to mostly medium sand.		
								Grading to coarser as hole becomes deeper.		

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW1

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
			1523					Grading to fine to medium sand; to reddish brown from greyish; with some fine gravel.		
	108		1550							Hydropunch sample taken from 30'-32' level.
35	56		1606				SP	SAND; greyish brown with some reddish layers; fine to coarse sand; with fine gravel; stiff.		
	20		1612					Grading with more gravel and gravelly layers.		Wanted to sample with Shelby tube at 38', but no clay layer.
	15		1620				SC	CLAYEY SAND/SANDY CLAY; grey.		Hydropunch sample taken from 38'-40' level.
40										TD = 40.2'; limestone bedrock at bottom of borehole.
45										
50										
55										
60										
65										
70										

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW2

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u> <u>Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/26/93</u>	<b>Date Completed:</b> <u>8/27/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft)</b> <u>13</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b> <u>7.0</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>M Stoker</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
			22	1615	0/0				
5				1634					
			4	1637	0/0				
10									
15									
20									
25									
30									

Hydropunch sample taken from 6'-8'.

TD = 13'.

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI






**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW3

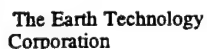
**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/26/93</u>	<b>Date Completed:</b> <u>8/27/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total: Depth (ft)</b> <u>13</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b> <u>6.0</u>	<b>Water Depth Elev.(ft):</b>
<b>Completion Information:</b> <u>This borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>M Stoker</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
15			15	1653	0/0			GP	GRAVEL; Artificial fill at surface for 1 foot.
5									SAND.
10								SP	SAND.
									SAND.
			6	1740	0/0			CL	CLAY/SILTY CLAY; grey; plastic.
15									
20									
25									
30									

Hydropunch sample at 7'.

TD = 13'.



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: S1MW4

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/27/93</b>	Date Completed: <b>8/27/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>3.0</b>	Water Depth Elev.(ft):		
Completion Information: <b>Borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>J Briegel</b>	

[illegible]



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/28/93</u>	<b>Date Completed:</b> <u>8/28/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>3</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b> <u>2.5</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>This borehole was abandoned. No Monitoring Well was installed.</u>		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
			7	0829	0/0			SP	SAND; dark brown; medium to coarse grained quartzose sand; well sorted.	<div>Augered from surface to 1'.</div> <div>Wet at 2.5'.</div> <div>TD = 3'. Did not drill/drive past 3'.</div> <div>Hydropunch sample taken between 3'-7'.</div>
5										
10										
15										
20										
25										
30										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI



Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW6

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft): <b>Ground:</b>	
		Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>	Date Completed: <b>8/28/93</b>
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>13</b>	Depth to Bedrock (ft): <b>NA</b>
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>
		Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>2.0</b>	Water Depth Elev. (ft):
Completion Information: <b>Borehole was completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>	Checked By: <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5	17		1043		0/0			SP	SAND; dark brown to brown; medium to coarse grained sand. Same as above, but wet.
10	7		1645					CL	CLAY; grey; plastic; with sand; with slight hydrocarbon odor.
15									
20									
25									
30									

Hydropunch sample taken between 3'-7' level.

Augered to 13'.  
TD = 13'.

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW7

**Sheet** 1 **of** 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>	Date Completed: <b>8/28/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>3</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>2</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>1.5</b>		Water Depth Elev.(ft):	
Completion Information: <b>Borehole was abandoned with Hole Plug and cuttings.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
			15	1112	0/0			SP	SAND; brown; coarse grained sand.	Wet at 1.5'.  TD = 3'. No augering/driving split spoon past 3'. Hydropunch sample taken at 3'-7' level.
5										
10										
15										
20										
25										
30										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW8

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>		Date Completed: <b>8/29/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole abandoned after caving in, filled with Hole Plug to surface.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5				1318				SAND; brown. Very moist to wet.		Wet at 2'.
								SP		No hydrocarbon odors this shallow.
	6			1632				CLAYEY SAND/SANDY CLAY; grey; with fine to medium grained sand; moderately stiff to stiff; moist; slight odor.		Hydropunch sample from 3'-7'. 8/28/93
10	4			1634				CH/SC		8/29/93
	4			1637				CH		Fine to medium grained sand stringer from 8.2' to 8.4'. Strong hydrocarbon odor.
15										TD = 13'.
20										
25										
30										

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW9**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/28/93</b>		Date Completed: <b>8/28/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>13</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA 2</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well. Well was abandoned soon after sampling. See monitoring well contruction log.</b>		Logged By:  <b>J Briegel</b>		Checked By:  <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
				1350				SP		
5				1407						
10				1612				CH		
15										TD = 13'.
20										
25										
30										

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW10

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/29/93</u>	<b>Date Completed:</b> <u>8/29/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>17</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b> <u>1.5</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Borehole completed as monitoring well. Casing pulled and hole grouted on 9/12/93 to surface. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel/D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
				1342				SP	
5			5	1402	0/0			SC	
			4	1418	0/0			SC/CL	
			3	1425				SP	
10			1	1435	0/0			CL	
			1	1445				CH	
15			1	1510				SP	
				1527					
20									
25									
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: S1MW11

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/29/93</b>	Date Completed: <b>8/29/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>2.0</b>	Water Depth Elev.(ft):		
Completion Information: <b>Borehole completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>P Lay</b>		Checked By: <b>D Jayne</b>	

[illegible]

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: S1MW12

Sheet 1 of 1

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/8/93</b>	Date Completed: <b>9/8/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>P Lay/D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
				1050					
5			4	1100				SP	
			6	1105					
10			4	1110					
			4	1112				CH	
			4	1120					
15									TD = 15'.
20									
25									
30									



## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

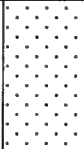






Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **S1MW13**

Sheet **1** of **1**

Borehole Location: <b>Site 1</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/8/93</b>	Date Completed: <b>9/10/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
				1515				SP	SAND; reddish brown; medium grained.	 Drove hydropunch from surface to 6'; collected water sample.  Wet at about 5'.
5			6	1543					Same as above.	
			6	1546				CL	SANDY CLAY; dark grey; with medium grained sand.	
10			5	1550				CH	CLAY; dark grey; medium stiff; highly plastic.	
				1553				CL	SANDY CLAY; with medium sand.	
15										TD = 15'.
20										
25										
30										

30

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW14

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/11/93</u>	<b>Date Completed:</b> <u>9/12/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>30</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b>	<b>Water Depth Elev.(ft):</b>
<b>Completion Information:</b> <u>Installed a 30' deep monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
5									See log of S1MW6 for detailed description of shallow lithology.
10									Augered from surface to 14.5' with 14.25" augers, then continued with 8.25" augers to TD at 30'.
15									Drove hydropunch from 20'-26'; collected water sample.
20									May have hit sand at 23 feet, according to driller's remarks.
25				0825					TD = 30'.
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

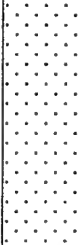
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** S1MW15

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 1</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/11/93</u>	<b>Date Completed:</b> <u>9/11/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>7</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <p style="text-align: center;"><b>J Briegel</b></p>	<b>Checked By:</b> <p style="text-align: center;"><b>J Briegel</b></p>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
5			4	1413	0/0			SP?		Augered from surface to 5 feet deep without recording lithology.
								SP		SAND; brown; medium to coarse grained, well-sorted, quartzose sand; wet.
10										
15										
20										
25										
30										

TD = 7'. Drove hydropunch down from 7'-10' and collected water.

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI




**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB2-A

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2 (Motor Pool)</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Top of Casing:</b>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Started:</b> <u>8/14/93</u>	<b>Date Completed:</b> <u>8/14/93</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Number of Samples:</b>	<b>Dist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>First of two boreholes named MP2SB2. Grouted to surface with bentonite.</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Logged By:</b> <u>J Briegel</u>		<b>Checked By:</b> <u>P Lay</u>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			54	0736	.5/0			AF	Asphalt topping 6" thick. Artificial fill: brown; sand with gravel.	Asphalt at the surface, underlain by sand/gravel subbase.
			33	0743	.5/0			SP	SAND; mottled brown and orange brown; medium to coarse sand; with trace of fines; loose; slightly moist.	Hydrocarbon odors not detected.
			25	0748	.2/0					
			26	0755	.1/0					
10									Duplicate soil sample collected. TD = 8'.	
15										
20										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI


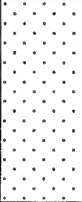
**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB2-B

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2 (Motor Pool)</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/17/93</u>	<b>Date Completed:</b> <u>8/17/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>5.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>Dist.: NA</u>	<b>Undist.: NA</b> <b>Core: NA</b>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Second of two boreholes named MP2SB2. Grouted to surface.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			55	1634	.4/0			AF	Artificial fill; sand with gravel.	Re-drill of earlier borehole (MP2SB2-A).
									SAND; brown to dark brown. Grading to grey.	
			40	1641				SP	SAND; brownish orange; medium grained sand.	
5										TD = 5'.

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI



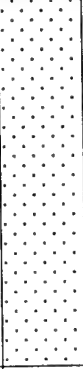
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB3

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/14/93</b>		Date Completed: <b>8/14/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface after sampling accomplished.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	STD (ppm)	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			27	0825				AF	6" of asphalt at surface. Artificial fill; light grey, medium grained sand.	6" of asphalt at surface.
			28	0830	.5/0			SP	SAND; light grey; medium grained sand.	PO2B30103 collected as duplicate.
			28	0835	.5/0	Grading to light brown.				
			15	0845	.1/0	Grading to with clay; moist.				
10									Wet at 6.5'. No fixed base sample collected.	
15									TD = 8'.	
20										

## BORING LOG

Project Name: **MI ANG, Alpena CRTS - Alpena, MI**



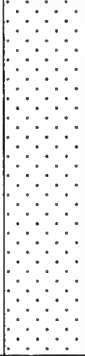
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB4-A**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/14/93</b>	Date Completed: <b>8/14/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>8.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.5</b>	Water Depth Elev. (ft):		
Completion Information: <b>Grouted to surface after sampling done. Hole was re-drilled later.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			25	0909	.5/0			AF	Asphalt pavement at surface for 6".	No sample had noticable hydrocarbon odors.
			34	0913	4.7/0				SAND; brown to orange brown; medium to coarse grained, well-sorted, sand; slightly moist.	
			22	0919	.5/0			SP	Color change to light brown.	
			18	0923	.1/0				Grading to coarse to very coarse sand.	
10									Water at 6.5'. Field screen only run on water.	
15									TD = 8'.	

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB4-B

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Top of Casing:</b>	
<b>Driller:</b> <u>D. Giffels</u>		<b>Date Started:</b> <u>8/17/93</u>	<b>Date Completed:</b> <u>8/17/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total: Depth (ft)</b> <u>5.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Completion Information:</b> <u>Grouted to surface after sampling done. Hole was re-drill from earlier one.</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			46	1725	0/0				Artificial fill; sand with gravel.	This is a re-drill of MP2SB4-A.
			30	1733	0/0				SAND; orange brown; medium grained, quartzose sand.	
									Grading to light brown.	No water encountered; no hydrocarbon odors detected.
5										TD = 5'.
10										
15										



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB5-A

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Started:</b> <u>8/14/93</u>	<b>Date Completed:</b> <u>8/14/93</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total Depth (ft):</b> <u>8.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Undist.: NA</b> <b>Core: NA</b>
<b>Completion Information:</b> <u>Grouted to surface after sampling done. Hole was re-drilled later.</u>		<b>Water Depth (ft bgs):</b> <u>6.5</u>	<b>Water Depth Elev. (ft):</b> <u>NA</u>
		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
		39	0950	0/0			AF	Asphalt at surface; underlain by sandy gravel base.
		32	0955	0/0				SAND; dark brown/orange; with clay layer; moist.
		34	1000	0/0			SP	Grading to light grey.
		13	1005	0/0				Grading slightly finer grained.
								Water at 6.5'. Field screen only run on water.
								TD = 8'.

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB5-B

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/17/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>8/17/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total: Depth (ft)</b> <u>5.0</u>	<b>Number of Samples:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Dist.:</b> <u>NA</u>	<b>Undist.:</b> <u>NA</u>
<b>Completion Information:</b> <u>Grouted to surface after sampling done.</u>		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<u>Hole was re-drill from earlier one.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			40	1657	.3/0			AF	Artificial fill; sand with gravel.	This is a re-drill of MP2SB5-A.
			25	1702	0/0			SP	SAND; brownish orange; medium grained sand.	
5										No water encountered; no hydrocarbon odors detected.
										TD = 5'.
10										
15										
20										

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**




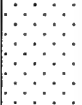
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2SB6**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>6.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>5.5</b>		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface with cement/bentonite mixture.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
5			49	1019	0/0			AF	Artificial fill; 2.5 feet of topsoil and fill; brown; sand and gravel; with organic debris; loose; dry.  SAND; light brown to orange brown; medium to coarse grained, quartz sand; loose; slightly moist.	No field screen done on samples.
			32	1026	0/0					Base of fill at 2.5'.
			31	1033	0/0			SP		No hydrocarbon odors detected while drilling/sampling.  Wet at 5.5'.
10										TD = 6'.
15										

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI





Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB7

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: <b>6.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>6.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Grouted to surface with cement/bentonite mixture.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			22	1056				AF	Artificial fill; topsoil covering gravelly sand.	Wet at about 6'.  TD = 6'.
			32	1101					SAND; mottled orange brown and brown; medium to coarse sand; loose; moist.	
			24	1106				SP	Grading to light brown; to mostly fine to medium grained sand.	
10										
15										
20										

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTS - Alpena, MI




**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB8

**Sheet** 1 **of** 3

<b>Borehole Location:</b> <u>Site 2</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/15/93</u>	<b>Date Completed:</b> <u>8/15/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>58.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>  </u>	<b>Dist.:</b> <u>NA</u> <b>Undist.:</b> <u>NA</u> <b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth (ft bgs):</b> <u>6.0</u>	<b>Water Depth Elev. (ft):</b> <u>  </u>
<b>Completion Information:</b> <u>Grouted to surface with cement/bentonite slurry.</u>		<b>Logged By:</b> <u>D Jayne</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS	
5			20	1246	0/0			AF	Artificial fill; topsoil and gravelly sand from surface to 1 foot deep.	No field screen.  Field screen done on 2'-4' sample.  Field screen done on 4'-6' sample.	
			19	1254	0/0						SAND; orange brown; medium grained, quartzose sand.
			25	1259	0/0						Grading to light brown.
10								SP	SAND.	Augered without sampling from 6' to 54'.	
15								SP	SAND; light brown; medium grained, quartzose sand.		
20											

20



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: MP2SB8

Sheet 2 of 3

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
25								SP	Same as above.	
30								SP	Same as above.	
35								SP	Same as above.	
40										
45									Same as above.	

## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2SB8

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
50									
52	52		1321				SP	Same as above.	
55			1405				CH	CLAY; with trace of sand; medium stiff; plastic.	Field screen done on 54'-56' sample.
									Shelby Tube sampler for 56'-58'.
60									TD = 58'.
65									
70									



**Client: HAZWRAP**

Sheet 1 of 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: <b>Top of Casing:</b>	
Drilling Agency: <b>Stearns</b>		Driller: <b>D. Giffels</b>		Date Started: <b>8/16/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: <b>6.0</b>		Date Completed: <b>8/16/93</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:		Depth to Bedrock (ft): <b>NA</b>	
Borehole Size (inches): <b>8.25"</b>		Dist.: <b>NA</b>		Undist.: <b>NA</b>	
Completion Information: <b>Grouted to surface with cement/bentonite slurry.</b>		Water Depth (ft bgs):		Core: <b>NA</b>	
		Water Depth Elev. (ft):			
		Logged By: <b>P Lay</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
5	31	1510	.4/0				AF	Asphalt 2" thick; underlain by gravel with sand to depth of 1 foot.	GC sample collected.  Soil sample (and duplicate) collected.
	34	1517	.2/0				SP	SAND; brownish yellow (10YR 6/6); sand fine grained; no odor; slightly moist.	
	26	1524	.1/0						
10									TD = 6'.
15									
20									
25									



# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2MW6**

Sheet **1** of **2**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/16/93</b>		Date Completed: <b>8/16/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>42</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			10	0827				AF	Artificial fill; dark brown; organic-rich topsoil.	Collected soil samples and water samples periodically.
									SAND; olive yellow (2.5Y 6/8); medium grained, quartz-rich, sand.	
5			8	0833				SP	Grading to pale yellow (2.5Y 7/4).	
									Grading to gray.	
10								SC	CLAY.	
			28	0915					With CLAYEY SAND lenses.	Hydropunch sample taken between 9'-14'.
15								GW	GRAVEL; well-graded gravel; with sand.	Field screen sample only.
			54	0921				SP	Coarse sand.	Field screen sample only.
20										
25										
										Hydropunch sample taken between 24'-28'.
30									SAND.	

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: MP2MW6

Sheet 2 of 2

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/B*	FID (ppm) S/B*			
35									
40			42	1007					
45									
50									
55									
60									
65									
70									

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**







Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **MP2MW7**

Sheet **1** of **1**

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/17/93</b>	Date Completed: <b>8/17/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>15</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>7.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
34	1742	0/0				AF	Artificial fill; SAND with gravel.		Field screen sample.
14	1746	0/0				SP	SAND; orange-brown; medium grained.		Field screen sample.
5							Same as above.		Wet at about 7'.
15									TD = 15'.
20									
25									
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI



**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** MP2SB10

**Sheet** 1 **of** 1

Borehole Location: <b>Site 2</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>NA</b>	Driller: <b>D. Jayne</b>	Date Started: <b>9/13/93</b>	Date Completed: <b>9/13/93</b>		
Drilling Equipment: <b>AMS Soil Auger</b>		Total: Depth (ft): <b>4.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hand Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>3"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Grouted to surface.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
				0917				AF	Artificial fill; gravelly sand/sandy gravel.	This is a hand auger borehole.
				0935				SP	SAND; orange brown; medium grained, well sorted, sand; no odor.	Collected 2 fixed base soil samples and 2 QA/QC samples.
5										TD = 4'.
10										
15										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI





**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** CG3SB12

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 3		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/26/93	<b>Date Completed:</b> 8/26/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 12.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA <b>Undist.:</b> NA <b>Core:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Grouted to surface with cement/bentonite slurry.		<b>Logged By:</b> M Stoker	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			18	0850	0/0			AF	Topsoil; dark brown; grass and roots; 4" thick.	Thin layer of topsoil present.
									SAND; orange-brown; fine sand; moist.	Gas chromatograph sample (P3SB12A).
			23	0855	0/0			SP		
5									Grading to greyish brown; to fine to medium grained sand.	Gas chromatograph sample (P3SB12B).
			20	0900						
										Gas chromatograph sample (P3SB12C).
10			31	0905				SP	Same as above, but dense; very moist.	Gas chromatograph sample (P3SB12D).
										TD = 15'.
15										
20										

# BORING LOG

**Project Name:** MI ANG, Alpena CRTS - Alpena, MI











































**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** CG3SB13

**Sheet** 1 **of** 3

<b>Borehole Location:</b> Site 3		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/26/93	<b>Date Completed:</b> 8/26/93
<b>Drilling Equipment:</b> CME 750		<b>Total: Depth (ft)</b> 55.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 13.5	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Installed a temporary piezometer (CG3PZ2), which was pulled out 9/12/93 and grouted with Hole Plug. See piezometer construction log.		<b>Logged By:</b> M Stoker	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
5			20	1110	0/0			AF	Topsoil; dark brown; with grass and roots; 6" deep.	Gas chromatograph sample (P3SB13A).
									SAND; orange brown; fine to medium sand; moist.	
			24	1115	0/0					
										
										
										
										
										
										
										
10			19	1119	0/0				SAND; orange brown; fine, rounded sand; moist.	Gas chromatograph sample (P3SB13B).
										
										
										
15			18		0/0				Same as above.	Gas chromatograph sample (P3SB13C).
										
										
20			79		0/0				Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13D).
										
										
25									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13E).
										
										
30									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13F).
										
										
35									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13G).
										
										
40									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13H).
										
										
45									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13I).
										
										
50									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13J).
										
										
55									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13K).
										
										
60									Grading to with trace of fine gravel; wet.	Gas chromatograph sample (P3SB13L).

## BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3SB13

Sheet 2 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
25								SP	Same as above.
30									Same as above.
35								SP	Same as above.
40									Same as above.
45								SP	

# BORING LOG

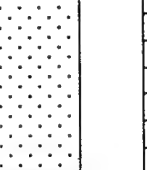
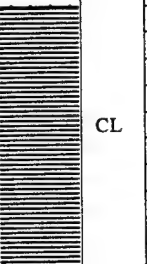
Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3SB13

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
50			29	1205	0/0				SAND; same as above. Grading to greyish brown; to fine to medium sand.  SILTY CLAY; grey; plastic.  CL  Shelby Tube sample from 53' to 55'; stiff grey clay.
			10	1218	0/0				
				1225					
55									TD = 55'.
60									
65									
70									



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI









**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** CG3SB11

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 3		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/26/93	<b>Date Completed:</b> 8/26/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 12.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA <b>Undist.:</b> NA <b>Core:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Borehole was grouted to surface with cement/bentonite.		<b>Logged By:</b> M Stoker	<b>Checked By:</b> P Lay

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
5			30	0820	0/0			AF	Topsoil; dark brown; grass, roots; 4" deep.	Thin layer of topsoil.
									SAND; yellowish brown; fine to medium sand; moist.	Collected duplicate sample.
										
			17	0825	0/0			SP		
									Same as above.	Gas chromatograph sample (P3SB11A).
10			24							Gas chromatograph sample (P3SB11B).
								SP	Grading to greyish brown; increase in moisture.	Gas chromatograph sample (P3SB11C).
			28							
15										TD = 12'.



# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3PZ1

Sheet 2 of 2

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*		
25								TD = 20'.
30								
35								
40								
45								

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **CG3MW6**

Sheet **1** of **2**

Borehole Location: <b>Site 3</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/25/93</b>	Date Completed: <b>8/30/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>33</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>15.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
5			15	1444	.1/0			SP	SAND; brown to light brown with orange brown mottling; medium to coarse grained, quartz sand; loose; slightly moist.	
10			42	1452	0/0			CL	SANDY CLAY lens.	
15			42	1456	0/0			SW SP	SAND; brown to light brown with orange brown mottling; medium to coarse sand; loose; moist.	Wet at about 15'.
20									Grading to with coarser sand; with trace very fine to fine gravel.	Hydropunch sample 16'-18'. Lithology not recorded past 15'.
25										No hydrocarbon odors detected in samples or cuttings.
30										Hydropunch sample 24'-28'.

# BORING LOG



Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW6

Sheet 2 of 2

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
35											TD = 33'.
40											
45											
50											
55											
60											
65											
70											



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800Name of Borehole or Well: CG3MW7

Sheet 1 of 2

Borehole Location: <b>Site 3</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/30/93</b>		Date Completed: <b>8/30/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>35</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>14.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well, with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>P Lay</b>		Checked By:  <b>J Briegel</b>	

[illegible]

# BORING LOG



Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: CG3MW7

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
29'							SP			
35			1520							TD = 35'.  Hydropunch sample at 35'-39'.
40										
45										
50										
55										
60										
65										
70										

# **BORING LOG**

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**


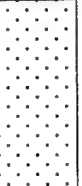


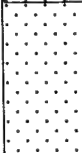
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **TF4SB15**

Sheet **1** of **2**

Borehole Location: <b>Site 4</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/11/93</b>	Date Completed: <b>8/11/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: <b>43.5</b>	Depth to Bedrock (ft): <b>NA</b> <b>43</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>26.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted with cement/bentonite slurry after sampling finished.</b>		Logged By: <b>J Briegel/M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			27	0850	0/0			AF	Artificial fill; grassy topsoil with gravel at surface.
									SAND; brown to light brown; medium grained, well-sorted, well-rounded, sand; no odor.
5			24	0900	0/0				Grading to with trace of gravel.
								SP	Grading to GRAVELLY SAND.
10			86	0909	0/0				SAND; light brown to brown; medium to coarse grained quartz sand; with minor gravel.
								SW	Same as above, but with angular to subangular RF gravel.
15			106	0918	0/0				
								SP	
			104	0927	0/0				
20									



# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: TF4SB15

Sheet 2 of 2

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
			</						

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI


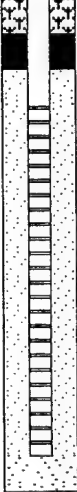







**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 5</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/12/93</u>	<b>Date Completed:</b> <u>8/12/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>14</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b> <u>5.0</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Installed a 2" diameter monitoring well. See monitoring well construction log.</u>		<b>Logged By:</b> <p style="text-align: center;"><b>D Jayne</b></p>	<b>Checked By:</b> <p style="text-align: center;"><b>J Briegel</b></p>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol	USCS
			12	0835				AF	Artificial fill; dark brown; topsoil with grass roots, etc.		Wet at about 5'.
								SP	SAND; orange brown; medium grained sand.		
5			1	0842					Grading to light brown.		
								CL	SANDY CLAY; light brown; moist.		
			1	0850				SP	SAND; orange brown; medium grained sand.		
10								CL	SANDY CLAY; light grey; moist.		
											
								SP	SAND.		
15											TD = 14'.
20											
25											
30											

TD = 14'.

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**









Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **SF5MW6**

Sheet **1** of **1**

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/12/93</b>	Date Completed: <b>8/12/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>21</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>5.0</b>	Water Depth Elev.(ft):		
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			8	1340	0/0			AF	Artificial fill; dark brown; sand with roots, etc.	
								SP	SAND; light brown; medium grained sand.	Field screen spoon sample.
5			4	1350	0/0				SANDY CLAY; light grey; moist.	Wet at about 5'.
10			4	1355	0/0			CL	CLAY; light grey; clay with sand; saturated.	Sample not analyzed.
									SAND; light grey; sand with clay.	Lithology not described between 10' and 19'; assumed to be mostly mostly sand.
15								SC		
20			15	1400	4/0				SAND; light grey; sand with clay.	
								SW	SAND; with clay and limestone gravel; very well-graded.	TD = 21'; limestone bedrock at bottom of borehole.
25										
30										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **SF5MW7**

Sheet **1** of **1**

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/12/93</b>	Date Completed: <b>8/12/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>20</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>6.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PTD (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
	9		1552		1.3/0			AF	Artificial fill; dark brown; sand with grass roots.
									SAND; light brown mottled orange; medium to coarse grained quartz sand.
5	10		1555		.9/0			SP	Grading to light brown.
10	35		1602		.5/0				Grading to brown; wet.
15								SP	Grades to greyish brown, mostly coarse sand.
									Sand grading much coarser, with much gravel.
20			1625		.5/0			CL	SANDY CLAY; grey to greyish brown; soft, plastic clay with 40% sand.
25									
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW8

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 5</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/31/93</u>	<b>Date Completed:</b> <u>8/31/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>20</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u> <b>Undist.:</b> <u>NA</u> <b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Installed monitoring well, with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel/D Jayne</u>	<b>Checked By:</b> <u>D Jayne</u>

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol			
5								SP	SAND.	No other descriptions recorded.
10									SAND.	
15								SP		Drive hydropunch sampler to 19'; collect sample for field screen.
20									SAND.	
20			1015							TD = 20'.
25										
30										

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** SF5MW9

**Sheet** 1 **of** 1

<b>Borehole Location:</b> Site 5		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 9/9/93	<b>Date Completed:</b> 9/10/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 19	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b> NA	<b>Dist.:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 8.0	<b>Water Depth Elev.(ft):</b>
<b>Completion Information:</b> Completed as a temporary monitoring well; with 2" casing. See monitoring well construction log.		<b>Logged By:</b> J Briegel/D Jayne	<b>Checked By:</b> D Jayne

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
5									
10				1404					
15				1440					
20									
25									

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **SF5TW10**

Sheet **1** of **1**

Borehole Location: <b>Site 5</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/10/93</b>	Date Completed: <b>9/10/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>5.0</b>	Water Depth Elev. (ft):		
Completion Information: <b>Grouted to surface with cement/bentonite.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>D Jayne</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
5									
10									
15									
20									

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW4

Sheet 1 of 1

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft): <b>Ground:</b>	
		Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/11/93</b>	Date Completed: <b>8/11/93</b>
Drilling Equipment: <b>CME 750</b>		Total: <b>20</b>	Depth to Bedrock (ft): <b>NA</b>
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>	Water Depth Elev.(ft):
Completion Information: <b>Completed as a monitoring well; with 2" diameter casing. Located at the landfill. See monitoring well construction log.</b>		Logged By: <b>J Briegel</b>	Checked By: <b>J Briegel</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*				Graphic Symbol
			8	1518	8/0			AF	Artificial fill; dark brown, organic-rich sand and gravel as topsoil.	HNU readings taken in headspace jars.
									SAND; light brown to orange brown mottled; fine to medium, well-sorted quartz sand.	
5			7	1525	0/0			SP	Grading to light brown to brown.	
									Grading to light brown.	
10			9	1532	0/0			CL	CLAY; brown; with minor silt and sand; plastic; saturated.	Wet at about 9 feet.
								SP	SAND; brown; medium to coarse sand.	
15									CLAYEY SAND.	
								SC	CLAYEY SAND.	
20										TD = 20'.
25										
30										



## BORING LOG

**Project Name:** MI ANG, Alpena CRTS - Alpena, MI





**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** LF6MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 6</u>		<b>Elevation and Datum (ft):</b> <u>Ground: Top of Casing:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/11/93</u>	<b>Date Completed:</b> <u>8/11/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>20</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs):</b> <u>15.0</u>	<b>Water Depth Elev.(ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <p style="text-align: center;"><b>J Briegel</b></p>	<b>Checked By:</b> <p style="text-align: center;"><b>J Briegel</b></p>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS			
14	1702	0/0				AF	Topsoil; dark brown; sand with organic matter to depth of 6".		Field screen sample only.
5	1709	0/0				SP	SAND; orange brown; medium grained.		Field screen sample not analyzed.
10	1716					SC/CL	CLAYEY SAND/SANDY CLAY; light brown to grey; with strong fuel odor.		Duplicate sample collected.
15							Same as above.		
20									TD = 20'.
25									
30									

## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** LF6MW6

**Sheet** 1 **of** 2

<b>Borehole Location:</b> <u>Site 6</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
		<b>Top of Casing:</b>	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>8/14/93</u>	<b>Date Completed:</b> <u>8/14/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total Depth (ft):</b> <u>42</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
		<b>Undist.:</b> <u>NA</u>	<b>Core:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b> <u>14.0</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>D Jayne/J Briegel</u>	<b>Checked By:</b> <u>J Briegel</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5			8	1410				SP	SAND; light brown; medium grained.
									Same as above.
10			11	1415					Same as above.
									Same as above.
15			9	1420				CL	SANDY CLAY.
									CLAYEY SAND; moist.
20								SC	Same as above.
									Same as above.
25								SC	Same as above.
									Same as above.
30									

## BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: LF6MW6

Sheet 2 of 2

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS		
								CLAYEY SAND; same as above.		
								SC		
35								Same as above.		
								Grading to SILTY CLAYEY SAND; with fines up to 20%; with some angular, fossiliferous limestone and shale RF and gravel; mostly fine to medium grained sand.		Well TD is 33'.
	81		1445		0/0					
	29		1450		0/0					Very resistant gravelly/bouldery zone.
40								SC		
	44		1502					CL		Borehole backfilled with Hole Plug from 42' to 34'.
								CLAY; grey; stiff to moderately stiff; with limestone/shale RF and gravel.		TD = 42'.
45										
50										
55										
60										
65										
70										

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW7**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>18</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>8.7</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as monitoring well; with 2" casing. Pulled and grouted 10 Sept 93. See monitoring well construction log</b>		Logged By: <b>D Jayne</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
	8		1655		0/0			AF	Artificial fill; dark brown; sandy topsoil.
									SAND; light brown; medium grained.
5								SP	
	10		1702		.1/0				Grading to orange brown; to moist.
	7		1707					CL	SANDY CLAY; moist.
10									
	5		1710					CH	CLAY; with some sand; medium stiff.
	9		1713					SP	SAND; very coarse grained.
								CH	CLAY; medium stiff.
15									
	7		1718		0.0			CL	SANDY CLAY.
								CH	CLAY; medium stiff; high plasticity.
			1734						
20									
25									
30									

Field screen only.

Wet at about 8.7'.

Shelby Tube sample at 17'-18'.

TD = 18'.

## BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW8**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/27/93</b>		Date Completed: <b>8/27/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>15</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>9.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>J Briegel/M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
	13		1530						
5									
	6		1534						
10					85/0				
	5		1542						
			1546						
15									
20									
25									
30									

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**

Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **LF6MW9**

Sheet **1** of **1**

Borehole Location: <b>Site 6</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/27/93</b>	Date Completed: <b>8/27/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>14</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs)		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By: <b>M Stoker</b>		Checked By: <b>J Briegel</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
			6	1650	0/0				
5			13	1654	0/0			SP	Topsoil; sand with organic matter (roots, etc.) to a depth of 4". SAND; orange brown; fine grained, poorly-graded sand; moist.
			13	1659	0/0				SAND; greyish brown; mostly fine sand; moist.
10			6	1705	0/0			CL	Grading to yellowish brown to greyish brown; with thin, clayey lenses.
									CLAY/SILTY CLAY; grey; plastic; moist.
15									
20									
25									
30									

TD = 14'.

Drove hydropunch to 17' and sampled.

# **BORING LOG**

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** LF6MW10

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <b>Site 6</b>		<b>Elevation and Datum (ft):</b> <b>Ground:</b>	
<b>Drilling Agency:</b> <b>Stearns</b>		<b>Driller:</b> <b>D. Giffels</b>	<b>Date Started:</b> <b>9/12/93</b>
<b>Drilling Equipment:</b> <b>CME 750</b>		<b>Date Completed:</b> <b>9/12/93</b>	
<b>Method of Drilling:</b> <b>Hollow Stem Augers</b>		<b>Total Depth (ft):</b> <b>13</b>	<b>Depth to Bedrock (ft):</b> <b>NA</b>
<b>Borehole Size (inches):</b> <b>8.25"</b>		<b>Number of Samples:</b> <b>NA</b>	<b>Dist.:</b> <b>NA</b>
<b>Completion Information:</b> <b>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</b>		<b>Water Depth (ft bgs):</b> <b>9.0</b>	<b>Water Depth Elev.(ft):</b>
		<b>Logged By:</b> <b>D Jayne/J Briegel</b>	<b>Checked By:</b> <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*	Graphic Symbol	USCS	
5				1134			Artificial fill; GRAVEL, with sand.		
10				1139			SAND; medium grained sand; with organic-rich zone containing wood fragments.		
15									Wet at 9 feet.
20									TD = 13'; possibly augered down to boulders or bedrock refusal.
25									Collected P6TW10 with hydropunch from 10' to 13'.

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** HN8SB2

**Sheet** 1 **of** 3

<b>Borehole Location:</b> Site 8		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/13/93	<b>Date Completed:</b> 8/13/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 59.0	<b>Depth to Bedrock (ft):</b> NA 59
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.:</b> NA <b>Undist.:</b> NA <b>Core:</b> NA
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 11.5	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Borehole grouted to surface with cement/bentonite slurry.		<b>Logged By:</b> J Briegel	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol





## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB2

Sheet 2 of 3

[illegible]



**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB2

Sheet 3 of 3

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# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB3

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft): <b>Ground:</b> <b>Top of Casing:</b>			
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/13/93</b>		Date Completed: <b>8/13/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>11.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs):		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

[illegible]



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: HN8SB4

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/13/93</b>		Date Completed: <b>8/13/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>14.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>13.8</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By:  <b>D Jayne</b>		Checked By:  <b>P Lay</b>	

[illegible]

# BORING LOG

Project Name: **MI ANG, Alpena CRTC - Alpena, MI**


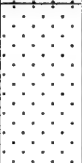

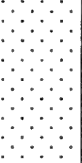
Client: **HAZWRAP**

Project Number: **931800**

Name of Borehole or Well: **HN8SB5**

Sheet **1** of **1**

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>		Date Started: <b>8/13/93</b>	Date Completed: <b>8/13/93</b>	
Drilling Equipment: <b>CME 750</b>			Total: Depth (ft) <b>11.0</b>	Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>			Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b> Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>			Water Depth (ft bgs):		Water Depth Elev. (ft):
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>			Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			52	1645				AF	Concrete; pavement 8" thick, underlain by gravel base.	Large cobble plugged the sampler; no sample caught.
									SAND; light brown; medium grained sand.	
5			21	1650	0/0			SP	Same as above.	
			35	1700				SP	Same as above, but moist.	
10										Collected MS/MSD sample for lab.
										TD = 11'.
15										
20										

# BORING LOG

Project Name: MI ANG, Alpena CRTS - Alpena, MI



Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: HN8SB6

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/15/93</b>	Date Completed: <b>8/15/93</b>		
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>14.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>NA</b>		Water Depth Elev. (ft):	
Completion Information: <b>Borehole was grouted to surface with cement/bentonite.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
			24	0844	0/0			GW	Artificial fill; dark grey; gravelly sand with roots; to a depth of 2'.	Grassy area at surface.
								SP	SAND; light brown to brown; medium to coarse, quartz sand; with trace of gravel; loose; slightly moist.	
5			30	0849	0/0				Same as above.	
			36	0856	.1/0				Same as above, but light brown.	
10			59	0903	0/0				SAND; light brown; fine to medium grained quartz sand; with trace of fine gravel; slightly moist.	
15										TD = 14'.
20										

## BORING LOG

# **BORING LOG**

Project Name: MI ANG, Alpena CRTC - Alpena, MI



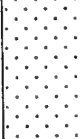
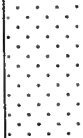
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: HN8SB8

Sheet 1 of 1

Borehole Location: <b>Site 8</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/17/93</b>	Date Completed: <b>8/17/93</b>		
Drilling Equipment: <b>CME 750</b>		Total Depth (ft): <b>11.0</b>	Depth to Bedrock (ft): <b>NA</b>		
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>NA</b>	Water Depth Elev. (ft):		
Completion Information: <b>Borehole was grouted to surface with cement/bentonite slurry.</b>		Logged By: <b>J Briegel</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks		
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol	USCS
			26	0849	0/0			AF	Concrete 8" thick at the surface; underlain by gravel and sand to 2.5'.	No fuel odors detected.  Thin layer of fine grained gravel from 10'-10.5'.  TD = 11'; not to water table.
5				0853	0/0			SP	SAND; orange brown to brown; medium to coarse grained quartz sand; well-sorted.	
								SP	Grading to light brown to greyish brown; to with fine gravel; loose; moist.	
10			54	0904	0/0				Grading to greyish brown.	
15										
20										



## BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** HN8MW5

**Sheet** 1 **of** 1

<b>Borehole Location:</b> <u>Site 8</u>		<b>Elevation and Datum (ft):</b> Ground: <u>9999.99'</u> Top of Casing:	
<b>Drilling Agency:</b> <u>Stearns</u>	<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/11/93</u>	<b>Date Completed:</b> <u>9/11/93</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Total: Depth (ft)</b> <u>20</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.:</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Water Depth: (ft bgs)</b> <u>12.8</u>	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> <u>Completed as a monitoring well; with 2" casing. See monitoring well construction log.</u>		<b>Logged By:</b> <u>J Briegel</u>	<b>Checked By:</b> <u>P Lay</u>

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/B*	FID (ppm) S/B*			
5							SP	SAND; greyish brown to brown.	
								Same as above.	
10							SP	Same as above.	
								Same as above.	
15			38	1625	0/0			SAND; brown; medium to coarse grained sand; wet.	Wet at 12.8'; measured down augers centerhole.
								Same as above.	
20									TD = 20'.
25									
30									

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** RT9SB13

**Sheet** 1 **of** 3

<b>Borehole Location:</b> Site 9		<b>Elevation and Datum (ft):</b> Ground: Top of Casing:	
<b>Drilling Agency:</b> Stearns	<b>Driller:</b> D. Giffels	<b>Date Started:</b> 8/29/93	<b>Date Completed:</b> 8/29/93
<b>Drilling Equipment:</b> CME 750		<b>Total Depth (ft):</b> 61.0	<b>Depth to Bedrock (ft):</b> NA
<b>Method of Drilling:</b> Hollow Stem Augers		<b>Number of Samples:</b>	<b>Dist.: NA</b> <b>Undist.: NA</b> <b>Core: NA</b>
<b>Borehole Size (inches):</b> 8.25"		<b>Water Depth (ft bgs):</b> 16.0	<b>Water Depth Elev. (ft):</b>
<b>Completion Information:</b> Grouted to surface with cement/bentonite slurry after drilling completed.		<b>Logged By:</b> D Jayne	<b>Checked By:</b> P Lay

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol
5									
10									
								</	



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: RT9SB13

Sheet 2 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol			USCS
									SAND; same as above.	
25								SP	Same as above.	
30									SAND; light brown; medium grained sand.	
35								SP	Same as above.	
40									Same as above.	
45								SP	Same as above.	

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

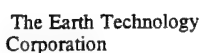
Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: RT9SB13

Sheet 3 of 3

Depth (feet)	Samples			Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS	
								CL	SANDY CLAY.
			54	0911	0/0				SAND; light brown; medium grained sand; with trace of clay.
50			40	0916	0/0			SP	Grading to coarser-grained.
			90	0929	0/0				SAND; same as above.
			61	0935	0/0				Same as above.
55			102	0948	0/0			SP	SAND; coarse to very coarse grained.
			76	0956	0/0				Grading to very coarse grained sand.
60				1015	0/0			CL	CLAY; grey; with sand and dark grey RF (calcareous shale).
									Clay and rock on tip of sampler; may be close to bedrock contact.
									TD = 61'.
65									
70									



# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client: HAZWRAP**

**Project Number:** 931800

Name of Borehole or Well: RT9MW6

Sheet 1 of 1

Borehole Location: <b>Site 9</b>		Elevation and Datum (ft): <b>Ground:</b> <b>Top of Casing:</b>			
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>8/30/93</b>		Date Completed: <b>8/30/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>23</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples: <b>NA</b>	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth: (ft bgs) <b>15.0</b>		Water Depth Elev.(ft):	
Completion Information: <b>Completed as a flush-mounted monitoring well; with 2" casing. See monitoring well construction log.</b>		Logged By:  <b>P Lay</b>		Checked By:  <b>D Jayne</b>	

[illegible]

# BORING LOG

**Project Name:** MI ANG, Alpena CRTC - Alpena, MI

**Client:** HAZWRAP

**Project Number:** 931800

**Name of Borehole or Well:** RT9TW7

**Sheet** 1 **of** 2

<b>Borehole Location:</b> <u>Site 9</u>		<b>Elevation and Datum (ft):</b> <u>Ground:</u>	
<b>Drilling Agency:</b> <u>Stearns</u>		<b>Driller:</b> <u>D. Giffels</u>	<b>Date Started:</b> <u>9/10/91</u>
<b>Drilling Equipment:</b> <u>CME 750</u>		<b>Date Completed:</b> <u>9/10/93</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Method of Drilling:</b> <u>Hollow Stem Augers</u>		<b>Total: Depth (ft):</b> <u>28.0</u>	<b>Depth to Bedrock (ft):</b> <u>NA</u>
<b>Borehole Size (inches):</b> <u>8.25"</u>		<b>Number of Samples:</b> <u>NA</u>	<b>Dist.: NA</b>
<b>Completion Information:</b> <u>Temporary well, which was grouted to the surface after sampling completed. See well construction log.</u>		<b>Undist.: NA</b>	<b>Core: NA</b>
<b>Water Depth (ft bgs):</b> <u>20.0</u>		<b>Water Depth Elev. (ft):</b>	
<b>Logged By:</b> <u>J Briegel</u>		<b>Checked By:</b> <u>P Lay</u>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS
5							SAND.	
10							SAND.	
15							SAND.	
20							SAND.	

No split spoon samples taken.

Drove hydropunch sampler at 19'; no water came into sampler.

## BORING LOG

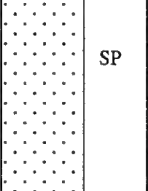
Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: RT9TW7

Sheet 2 of 2

Depth (feet)	Samples				Field Analysis		Log		Lithologic Description	Remarks
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*	Graphic Symbol	USCS		
25								SP	SAND.	Collected hydropunch water sample (P9TW7AW) at 21'.
30									SAND.	TD = 28'; collected hydropunch water sample (P9TW7BW) at 31'.
35										
40										
45										

# BORING LOG

Project Name: MI ANG, Alpena CRTC - Alpena, MI

Client: HAZWRAP

Project Number: 931800

Name of Borehole or Well: RT9TW8

Sheet 1 of 1

Borehole Location: <b>Site 9</b>		Elevation and Datum (ft):		Ground: Top of Casing:	
Drilling Agency: <b>Stearns</b>	Driller: <b>D. Giffels</b>	Date Started: <b>9/9/93</b>		Date Completed: <b>9/9/93</b>	
Drilling Equipment: <b>CME 750</b>		Total: Depth (ft) <b>19.0</b>		Depth to Bedrock (ft): <b>NA</b>	
Method of Drilling: <b>Hollow Stem Augers</b>		Number of Samples:	Dist.: <b>NA</b>	Undist.: <b>NA</b>	Core: <b>NA</b>
Borehole Size (inches): <b>8.25"</b>		Water Depth (ft bgs): <b>7.0</b>		Water Depth Elev. (ft):	
Completion Information: <b>Temporary monitoring well with 2" casing; pulled and grouted after sampling complete. See monitoring well construction log.</b>		Logged By: <b>D Jayne</b>		Checked By: <b>P Lay</b>	

Depth (feet)	Samples		Field Analysis		Log		Lithologic Description	Remarks	
	Number	Type	Blow Count	Drilling Time	PID (ppm) S/J/B*	FID (ppm) S/J/B*			Graphic Symbol

SAND; reddish brown; medium grained.

SP

SAND; same as above.

SP

Water came up to 7'.

Tried to get water sample with hydropunch at 8'; but no water. Hydropunch sample P5TW9AW at 9'.

Hydropunch sample P5TW9BW (and duplicate) collected at 18'.

TD = 19'; may have hit bedrock.



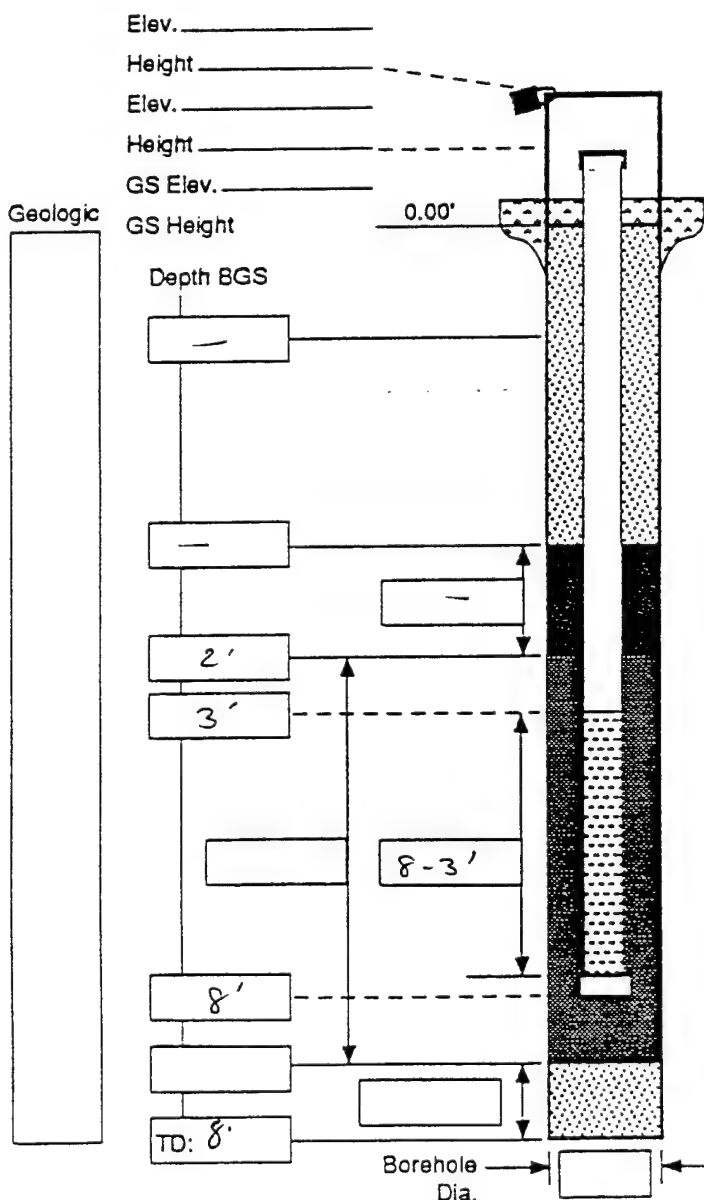


## **Monitoring Well Construction Forms**



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIPZ1</u>	Well ID: <u>SIPZ1</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/23/93</u>	Depth to Water (ft): <u>~2</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/mjg</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: JSB  
 Diameter: 2"  
 Depth BGS: 7/21/93 Weep Hole (Y/N)

## GUARD POSTS (Y/N)

No.: — Type: —

## SURFACE PAD

Composition and Size: —

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): 3'-0"  
 Ventilated Cap (Y/N) —

## GROUT

Composition and Proportions: —

Tremied (Y/N) —

Interval BGS: —

## CENTRALIZERS

Depth(s): —

## SEAL

Type: —  
 Source: —  
 Setup / Hydration Time: — Vol. Fluid Added: —

Tremied (Y/N) —

## FILTER PACK

Type: Global #7  
 Amt. Used: 3 bags (50#) each  
 Tremied (Y/N) — 8'-2' BGS  
 Source: Global Drilling Supplies

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC  
 Diameter: 2"  
 Slot Size and Type: 0.010  
 Interval BGS: 8'-3'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) —

## BACKFILL PLUG

Material: JSB 9/21/93  
 Setup / Hydration Time: —  
 Tremied (Y/N) —

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/23/93</u>
Well: <u>SIP22</u>	Well ID: <u>PSIP22</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/23/93</u>	Depth to Water (ft): <u>—</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DP Payne</u>	Checked by: <u>J Smaygel</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>

## PROTECTIVE CSG

Material / Type: JSB  
Diameter: 2"  
Depth BGS: 7/21/93 Weep Hole (Y/N)  
GUARD POSTS (Y/N)  
No. — Type: —

## SURFACE PAD

Composition and Size: —

## RISER PIPE

Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 3'-0"  
Ventilated Cap (Y/N)

## GROUT

Composition and Proportions: —

## Tremied (Y/N)

Interval BGS: JSB 9/21/93

## CENTRALIZERS

Depth(s): —

## SEAL

Type: —

Source: —

Setup / Hydration Time: — Vol. Fluid Added: —

## Tremied (Y/N)

FILTER PACK

Type: Global Drilling Supplies

AML Used: 3 50 lb bags

Tremied (Y/N) 8'-2' BGS; Global #7

Source: —

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 8'-3'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N)

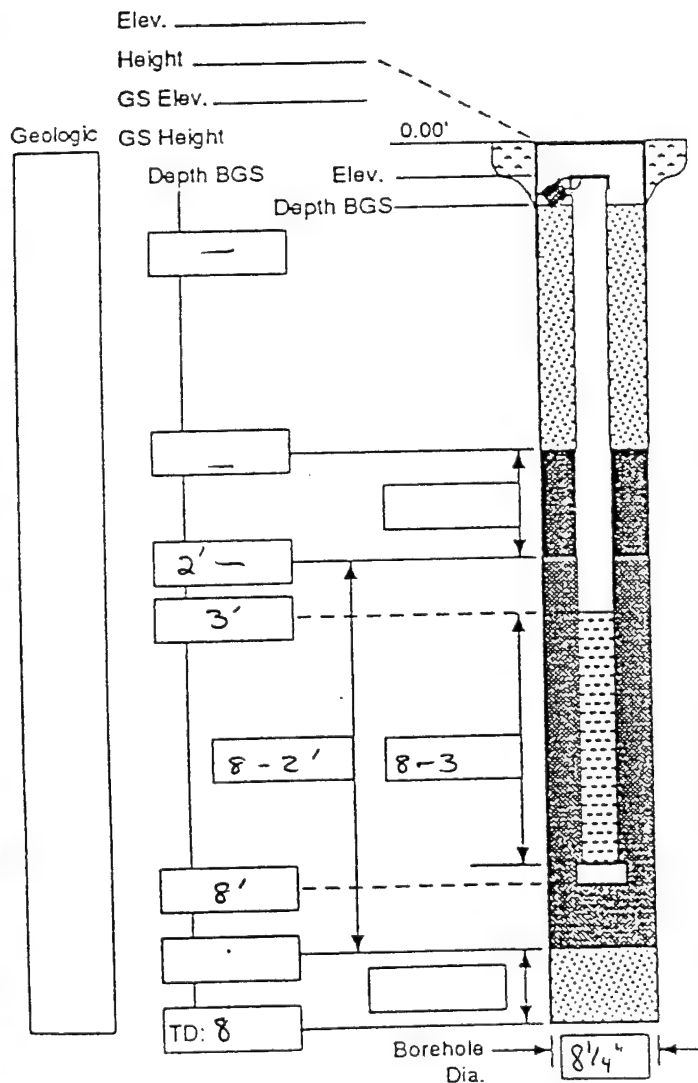
## BACKFILL PLUG

Material: JSB 9/21/93

Setup / Hydration Time: —

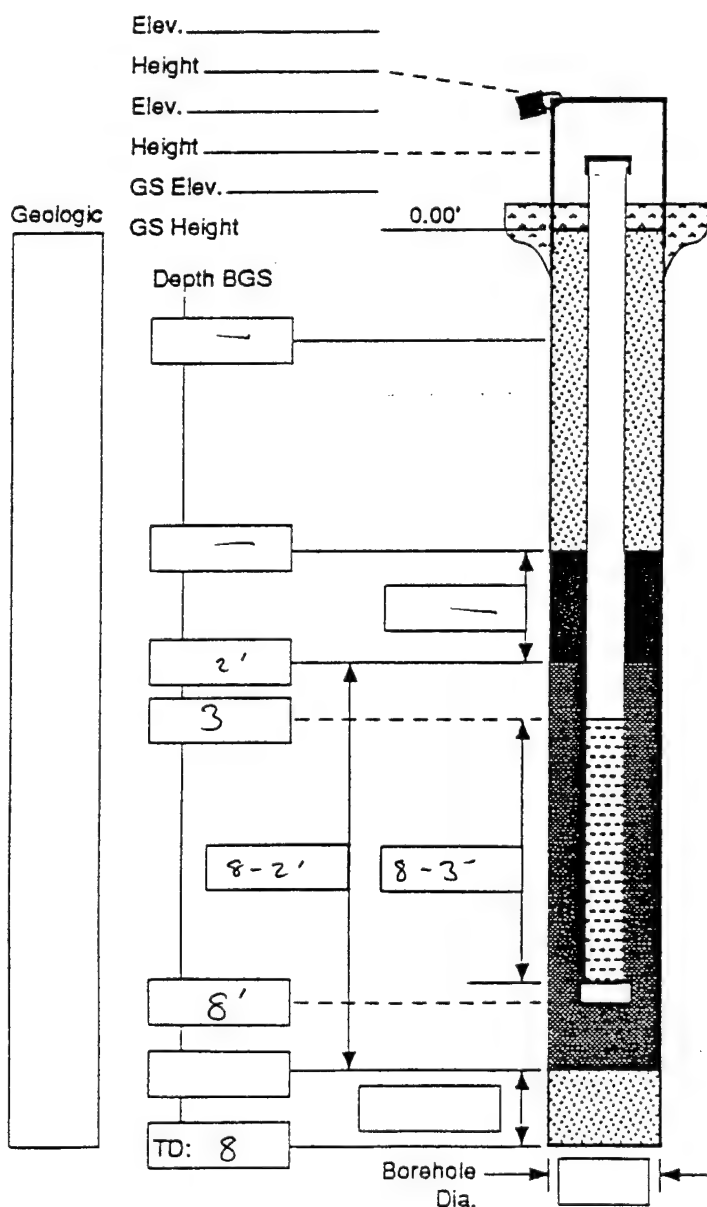
Tremied (Y/N)

Form F-1025



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIPZ3</u>	Well ID: <u>SIPZ3</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>8'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/23/93</u>	Depth to Water (ft): <u>~2'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/meg</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



**PROTECTIVE CSG**  
Material / Type: JSB  
Diameter: \_\_\_\_\_  
Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

**GUARD POSTS (Y/N)**  
No.: \_\_\_\_\_ Type: \_\_\_\_\_

**SURFACE PAD**  
Composition and Size: \_\_\_\_\_

**RISER PIPE**  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 3' to ~0'  
Ventilated Cap (Y/N) \_\_\_\_\_

**GROUT**  
Composition and Proportions: \_\_\_\_\_

**TRIMMED (Y/N)** JSB  
Interval BGS: \_\_\_\_\_

**CENTRALIZERS**  
Depth(s): \_\_\_\_\_

**SEAL**  
Type: \_\_\_\_\_  
Source: \_\_\_\_\_  
Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_

**TRIMMED (Y/N)** \_\_\_\_\_  
Interval BGS: \_\_\_\_\_

**FILTER PACK**  
Type: Global #7  
Amt. Used: 3-50# bags  
Trimmed (Y/N) 8'-2' BGS  
Source: Global Drilling Supplies  
Gr. Size Dist.: \_\_\_\_\_

**SCREEN**  
Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 8'-3' BGS

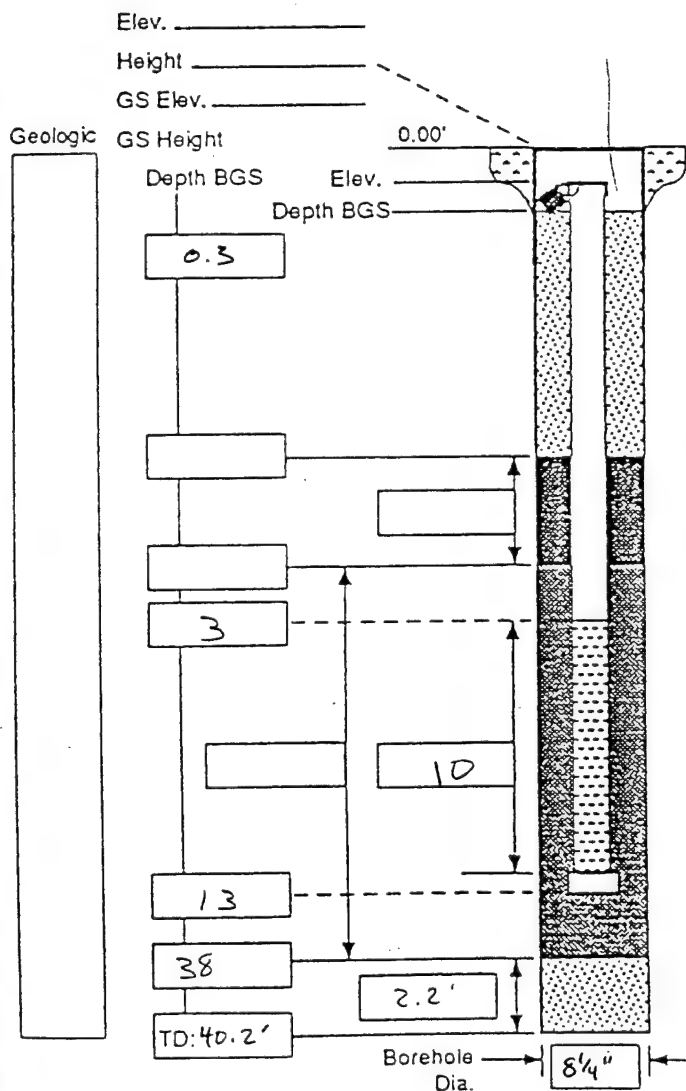
**WELL FOOT (Y/N)** \_\_\_\_\_  
Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

**BOTTOM CAP (Y/N)** \_\_\_\_\_

**BACKFILL PLUG**  
Material: JSB  
Setup / Hydration Time: 9/21/93  
Trimmed (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins AR6</u>	Project Number: <u>931800</u>	Date: <u>8/24/93</u>
Well: <u>51MW1</u>	Well ID: <u>51MW1</u>	Sheet: <u>1 of 1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>40.5</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/24/93</u>	Depth to Water (ft): <u>3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/24/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>hollow stem auger</u>	Logged by: <u>ME Shuler</u>	Checked by: <u>JS Bruegel</u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: N/A

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (Y/N)

No. \_\_\_\_\_

Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): ~3'

Ventilated Cap (Y/N) \_\_\_\_\_

## GROUT

Composition and Proportions: cement/bentonite mixture  
~13 - 1'

Tremied (Y/N) \_\_\_\_\_

Interval BGS: ~13 - 1'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bentonite pellets

Source: Baroid

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gallons

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Global Drilling Supplies #7

AML Used: 7-50 16 bags

Tremied (Y/N) \_\_\_\_\_

Source: Global drilling supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: PVC Schedule 40

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 3-13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_

## BACKFILL PLUG

Material: hole plug 40.5-38 ; collapse 38-20

Setup / Hydration Time: \_\_\_\_\_

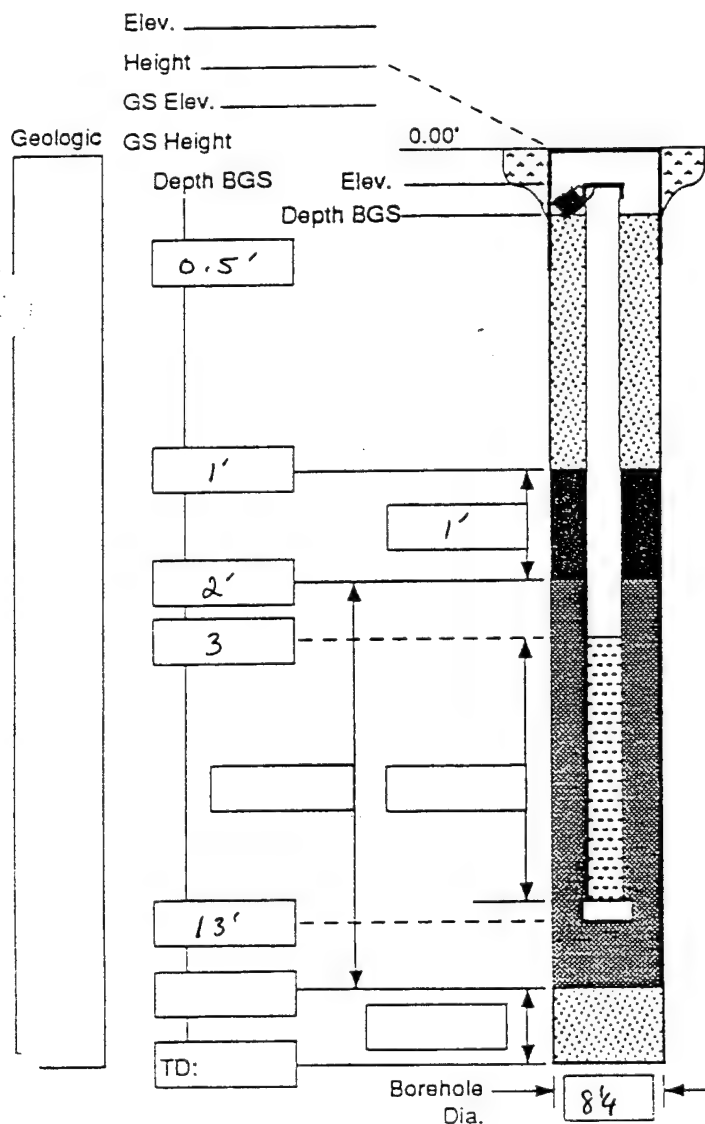
Tremied (Y/N) \_\_\_\_\_

hole plug 20-15'

Form F-1025

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/27/93</u>
Well: <u>SIMW2</u>	Well ID: <u>SIMW2</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/26/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/27/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>MES</u>	Checked by: <u>JSBriegel</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: JSS 7/21/93

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (Y/N)

No. \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): ~3'

Ventilated Cap (Y/N) \_\_\_\_\_

## GROUT

Composition and Proportions: hole plug 1'-6"

Tremied (Y/N) \_\_\_\_\_

Interval BGS: 1' - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bentonite pellets 2'-1' BGS

Source: Baroid

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gallo

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Global Drilling Supplies #7

Amt. Used: ~7-50 # bags

Tremied (Y/N) 13-2'

Source: Global Drilling

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3-13'

WELL FOOT (Y/N) \_\_\_\_\_

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_

## BACKFILL PLUG

Material: N/A

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_



# Monitoring Well Construction Log - Flush Mount

Project Name: <b>Phelps Collins ANG</b>	Project Number: <b>931800</b>	Date: <b>8/27/93</b>
Well: <b>SIMW3</b>	Well ID: <b>SIMW3</b>	Sheet: <b>1</b> of <b>1</b>
Driller: <b>D. Gaffels</b>	Borehole Diameter (in): <b>8 1/4" O.D.</b>	Total Depth (ft): <b>13'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>8/27/93</b>	Depth to Water (ft): <b>~3'</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>8/27/93</b>	Elevation and Datum: <b>-</b>
Drilling Method: <b>Hollow Stem Auger</b>	Logged by: <b>DEJyne</b>	Checked by: <b>J S Bruegel</b>
Drilling Fluid: <b>None</b>	Number of Samples: <b>-</b>	Date: <b>-</b>

## PROTECTIVE CSG

Material / Type: **JSB 9/21/93**  
Diameter: \_\_\_\_\_  
Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_  
GUARD POSTS (Y/N) \_\_\_\_\_  
No. \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: **concrete 2' x 2'**

## RISER PIPE

Type: **Schedule 40 PVC**  
Diameter: **2"**  
Total Length (TOC to TOS): **10' JSB 8/24/93 ~3'**  
Ventilated Cap (Y/N) \_\_\_\_\_  
GROUT  
Composition and Proportions: **hole plug**

## Tremied (Y/N)

Interval BGS: **~1' - 0.5'**

## CENTRALIZERS

Depth(s): **N/A**

## SEAL

Type: **Hole plug - bentonite pellets 2'-1'**

Source: **Baroid**

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: **5 gallons**

## Tremied (Y/N)

## FILTER PACK

Type: **Global Filter Pack #7**

AML Used: **7-50 lb bags**

## Tremied (Y/N)

Source: **Global Drilling Supplies**

Gr. Size Dist: **13'-2' Bgs**

## SCREEN

Type: **schedule 40 PVC**

Diameter: **8" O.D. 2"**

Slot Size and Type: **0.010"**

Interval BGS: **13'-3'**

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

## Bottom Cap (Y/N)

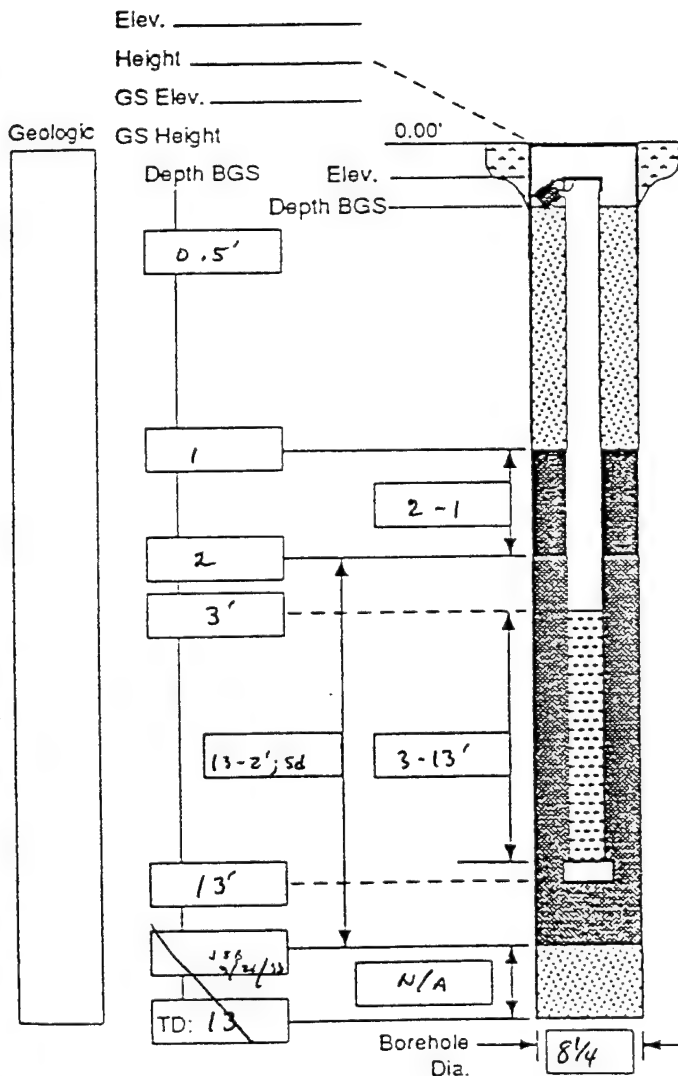
## BACKFILL PLUG

Material: **N/A**

Setup / Hydration Time: \_\_\_\_\_

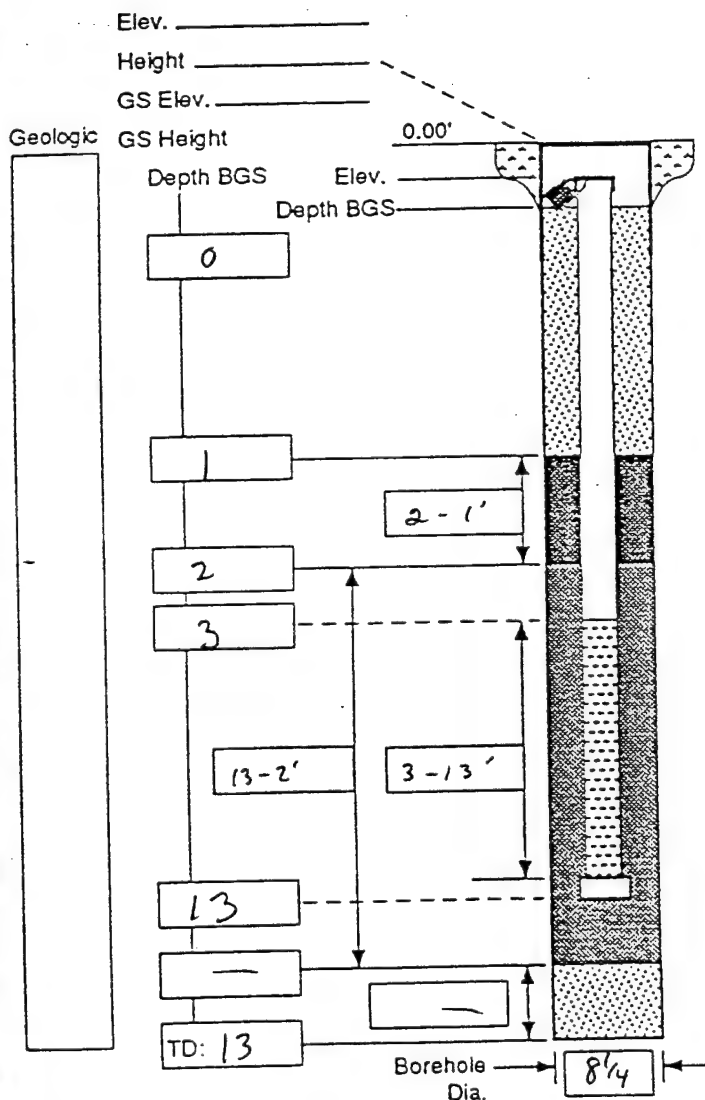
Tremied (Y/N) \_\_\_\_\_

Form F-1025



# Monitoring Well Construction Log - Flush Mount

Project Name: <b>Phelps Collins</b>	Project Number: <b>931800</b>	Date: <b>08/27/93</b>
Well: <b>.S1MW4</b>	Well ID: <b>91MW4</b>	Sheet: <b>1 of 1</b>
Driller: <b>D. Giffels</b>	Borehole Diameter (in): <b>8 1/4 OD</b>	Total Depth (ft): <b>13'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>08/27/93</b>	Depth to Water (ft): <b>~3</b>
Drilling Equipment: <b>CME 950</b>	Date Finished: <b>08/27/93</b>	Elevation and Datum: <b>-</b>
Drilling Method: <b>HS</b>	Logged by: <b>M. Stoker</b>	Checked by: <b>JSB/meg</b>
Drilling Fluid: <b>None</b>	Number of Samples: <b>-</b>	Date: <b>-</b>



## PROTECTIVE CSG

Material / Type: **JSB 9/21/93**

Diameter: **-**

Depth BGS: **-** Weep Hole (Y/N)

## GUARD POSTS (Y/N)

No.: **-** Type: **-**

## SURFACE PAD

Composition and Size: **concrete 2' x 2'**

## RISER PIPE

Type: **Schedule 40 PVC**

Diameter: **2"**

Total Length (TOG to TOS): **~3'**

Ventilated Cap (Y/N)

GROUT

Composition and Proportions: **hole plug ~1'-0.5'**

Tremied (Y/N) **~1'-0.5'**

Interval BGS: **-**

## CENTRALIZERS

Depth(s): **N/A**

## SEAL

Type: **benonite pellets ~2'-1'**

Source: **Baroid**

Setup / Hydration Time: **-** Vol. Fluid Added: **5 gallons**

Tremied (Y/N)

FILTER PACK

Type: **Global Drilling Supplies #7**

AmL Used: **7-50# bags**

Tremied (Y/N) **13-2'**

Source: **Global Drilling**

Gr. Size Dist: **-**

SCREEN

Type: **Schedule 40 PVC**

Diameter: **2"**

Slot Size and Type: **0.010"**

Interval BGS: **3-13**

WELL FOOT (Y/N)

Interval BGS: **-** Length: **-**

Bottom Cap (Y/N)

BACKFILL PLUG

Material: **JSB 9/21/93**

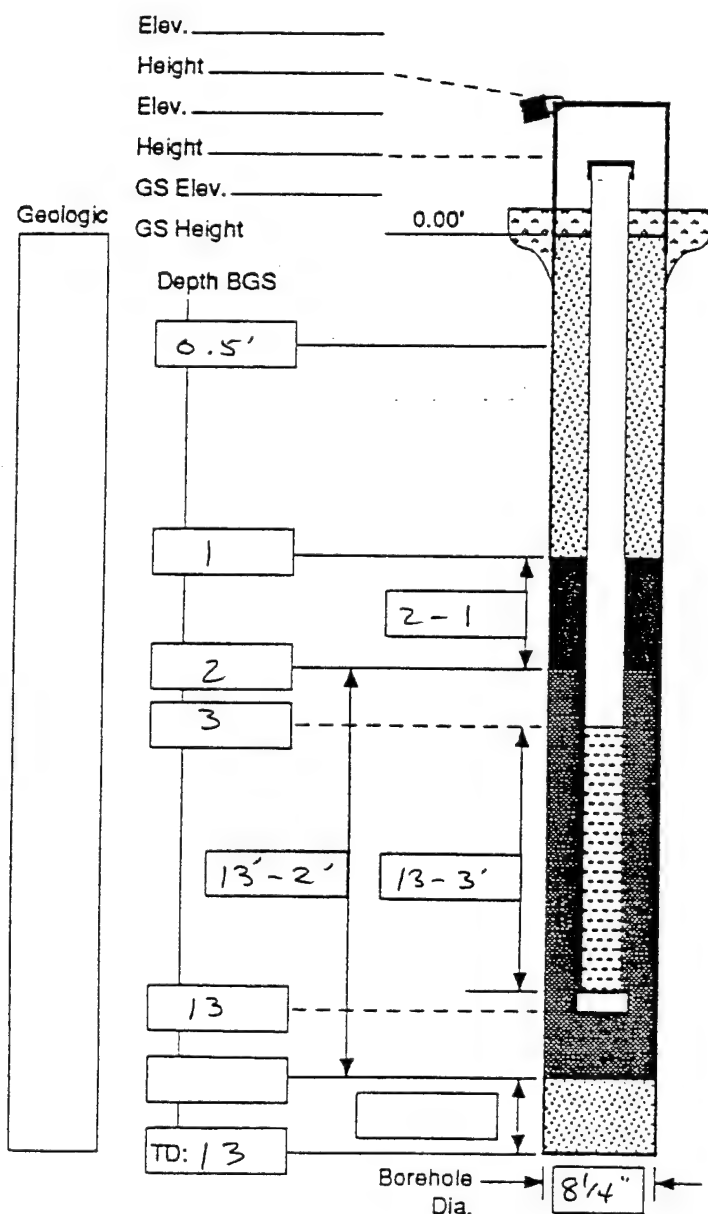
Setup / Hydration Time: **-**

Tremied (Y/N)

Form F-1025

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/28/93</u>
Well: <u>SIMW6</u>	Well ID: <u>SIMW6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/28/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/28/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB 9/21/93 JSBnegeal</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: Steel casing

Diameter: 4"

Depth BGS: — Weep Hole (Y/N) —

## GUARD POSTS (Y/N)

No.: 3 Type: Cedar

## SURFACE PAD

Composition and Size: concrete 2' x 2'

RISER PIPE Schedule 40 PVC

Type: 2"

Total Length (TOC to TOS): 3' + 2' 5'

Ventilated Cap (Y/N) —

## GROUT

Composition and Proportions: hole plug 1' - 0.5'

Tremied (Y/N) —

Interval BGS: 1 - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bentonite pellets ~ 2' - 1'

Source: Baroid

Setup / Hydration Time: — Vol. Fluid Added 5 gallon

Tremied (Y/N) —

## FILTER PACK

Type: Global Drilling Supplies #7

Amt. Used: 7 - 50# bags

Tremied (Y/N) — 13 - 2'

Source: Global Drilling

Gr. Size Dist: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) —

## BACKFILL PLUG

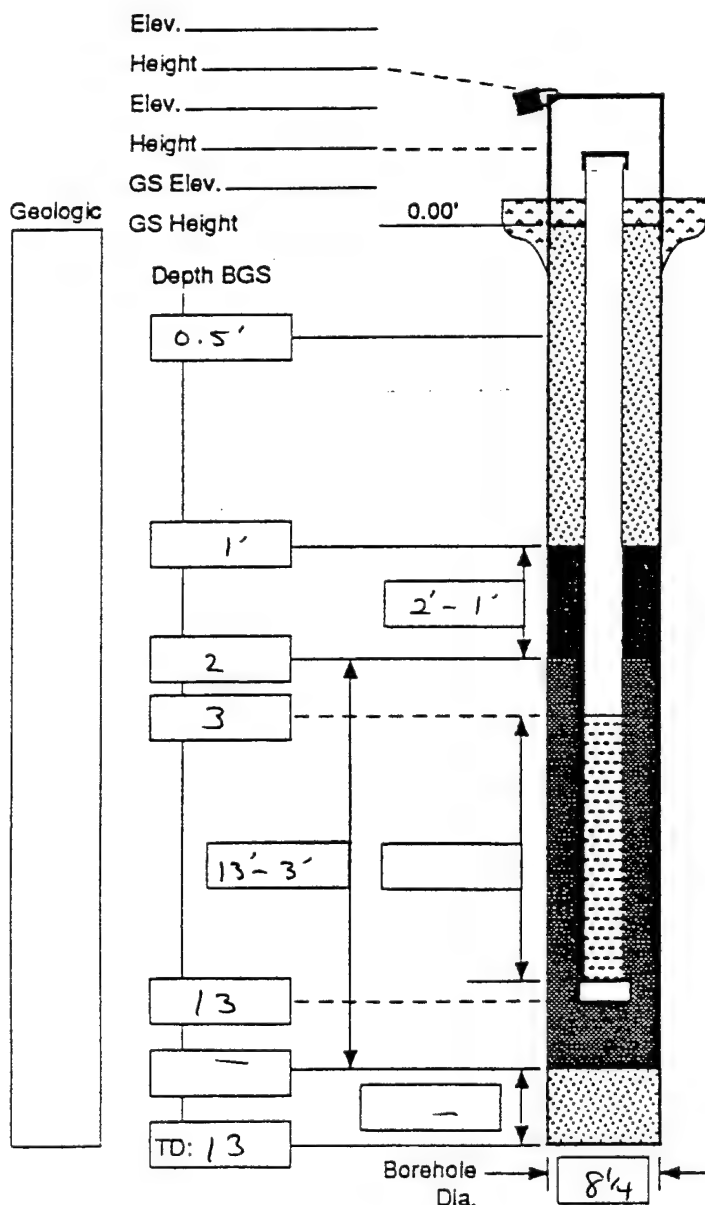
Material: JSB 9/21/93

Setup / Hydration Time: —

Tremied (Y/N) —

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/28/93</u>
Well: <u>SITW9 (SIMW9)</u>	Well ID: <u>SITW9</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft):
Drilling Agency: <u>Stearns</u>	Date Started:	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished:	Elevation and Datum:
Drilling Method: <u>Hollow stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>PHC</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSO

Material / Type: JSB 9/21/93

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS (Y/N) \_\_\_\_\_

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: \_\_\_\_\_

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -3' to +2'

Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: none

Tremied (Y/N) (N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: hole plug - bentonite

Source: Baroid ~ 2'-1'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gal

Tremied (Y/N) (N)

## FILTER PACK

Type: Global Drilling #7 - 13'-2' BGS

Amt. Used: 7 - 50 # bags

Tremied (Y/N) (N)

Source: Global Drilling supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (Y)

## BACKFILL PLUG

Material: JSB 9/21/93

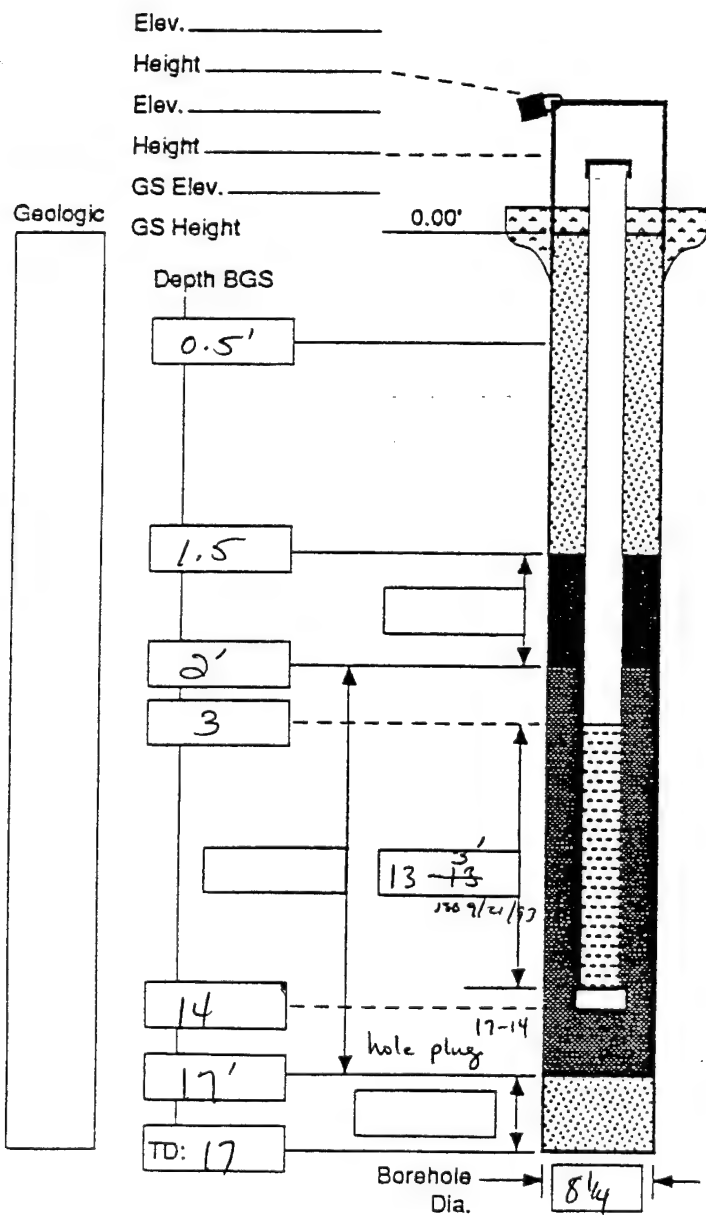
Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>93/800</u>	Date: _____
Well: <u>SIMW10 (temporary well)</u>	Well ID: <u>SIMW10</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>17</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/29/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/12/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSBriegel</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: _____

pulled 9/12/93



**PROTECTIVE CSG**  
Material / Type: \_\_\_\_\_  
Diameter: \_\_\_\_\_  
Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_  
**GUARD POSTS** (Y/N) \_\_\_\_\_  
No.: \_\_\_\_\_ Type: \_\_\_\_\_

**SURFACE PAD**  
Composition and Size: \_\_\_\_\_

**RISER PIPE**  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): -3' to +2' (~5')  
Ventilated Cap (Y/N) \_\_\_\_\_

**GROUT**  
Composition and Proportions: hole plug  
1.5 - 0.5'

Tremied (Y/N) \_\_\_\_\_  
Interval BGS: 1.5 - 0.5'

**CENTRALIZERS** N/A  
Depth(s): \_\_\_\_\_

**SEAL**  
Type: pellets - bentonite  
Source: Buroid  
Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gal

Tremied (Y/N) \_\_\_\_\_  
**FILTER PACK**  
Type: Global Drilling Supplies #7  
Amt. Used: 7-50 # bags  
Tremied (Y/N) \_\_\_\_\_ 2-14' BGS  
Source: Global #7

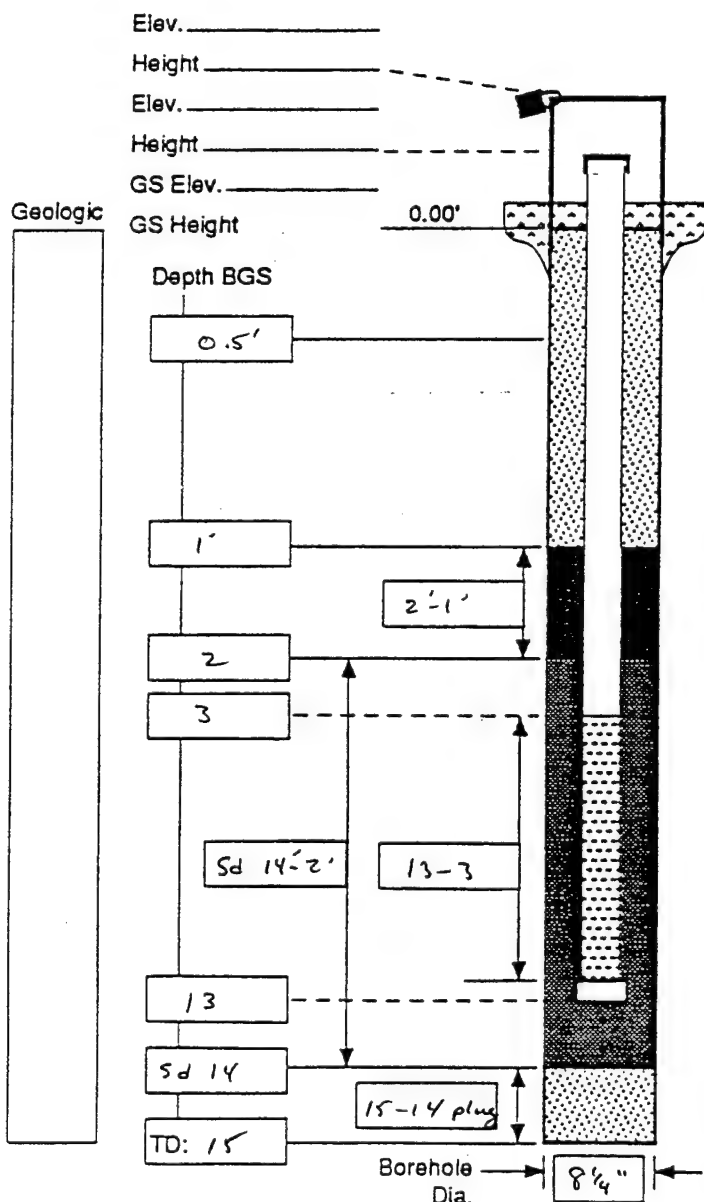
Gr. Size Dist: \_\_\_\_\_  
**SCREEN**  
Type: PVC Schedule 40  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 3-13

**WELL FOOT** (Y/N) \_\_\_\_\_  
Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_  
**BACKFILL PLUG**  
Material: hole plug  
Setup / Hydration Time: 14-17  
Tremied (Y/N) through auger

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/29/93</u>
Well: <u>SIMW11</u>	Well ID: <u>SIMW11</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (In): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/29/93</u>	Depth to Water (ft): <u>~3</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/29/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSM</u>	Checked by: <u>PHL</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSG

Material / Type: Steel casing  
Diameter: 4"  
Depth BGS: -1 to +2.5' Weep Hole (Y/N) (N)  
GUARD POSTS (Y/N) (N)  
No.: - Type: -

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): -3' to +2' (5')  
Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug  
1' - 0.5'  
Tremied (Y/N) (N)  
Interval BGS: 1' - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets  
Source: Boroid 2'-1'  
Setup / Hydration Time: - Vol. Fluid Added: 5 galls

## FILTER PACK

Type: Global #7  
Amt. Used: 7 - 50# bags  
Tremied (Y/N) (N) 9/1/93 2-14' 2'-14' BGS  
Source: Global Drilling Supplies

## Gr. Size Dist.

## SCREEN

Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 3 - 13'

## WELL FOOT (Y/N)

Interval BGS: - Length: -

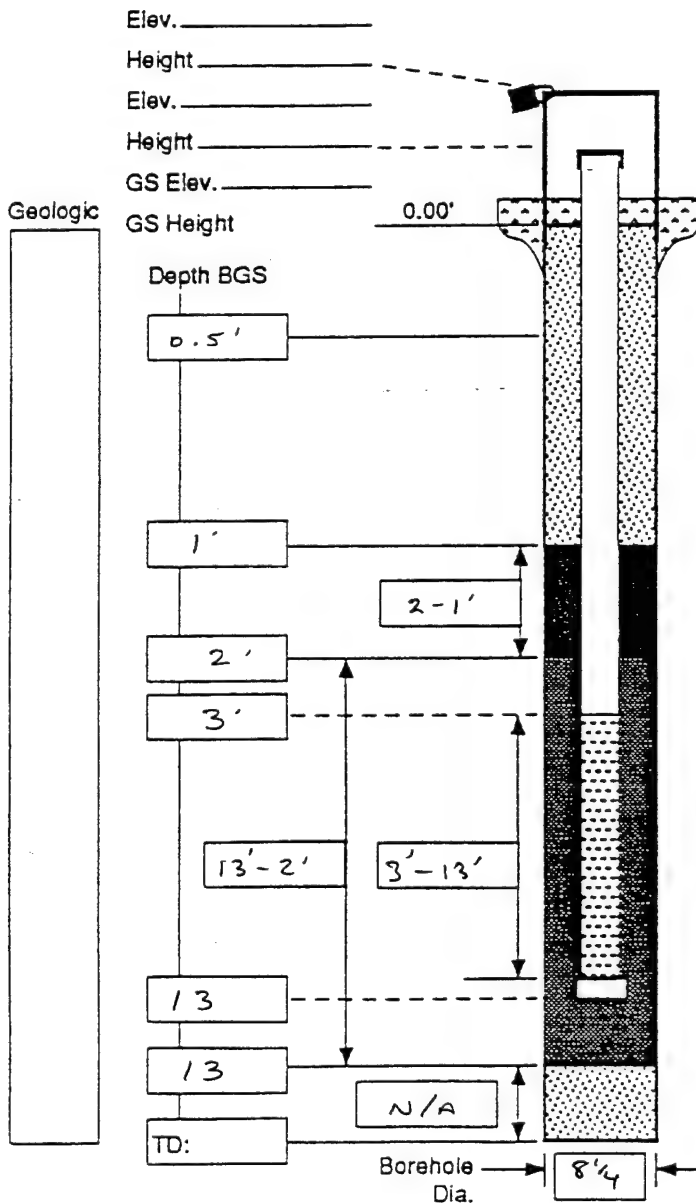
## Bottom Cap (Y/N)

BACKFILL PLUG

Material: JSS 9/21/93  
Setup / Hydration Time: -  
Tremied (Y/N) (N)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>93/800</u>	Date: <u>9/8/93</u>
Well: <u>SMW12</u>	Well ID: <u>SMW12</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/8/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/8/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>Phly</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>9/22/93</u>



## PROTECTIVE CSQ

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: +2' - -2' Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOC to TOS): -3 to +2'  
 Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug  
1' - 0.5'

## Tremied (Y/N)

Interval BGS: 1' - 0.5'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: ben tonite pellets  
 Source: Baroid 2' - 1'  
 Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5  
gallons  
 Tremied (Y/N) (N)

## FILTER PACK

Type: Global #7  
 Amt. Used: 6 - 50# bags  
 Tremied (Y/N) (N) 13' - 2'  
 Source: Global Drilling Supplies

## Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC  
 Diameter: 2"  
 Slot Size and Type: 0.010"  
 Interval BGS: 3' - 13'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

## Bottom Cap (Y/N)

BACKFILL PLUG

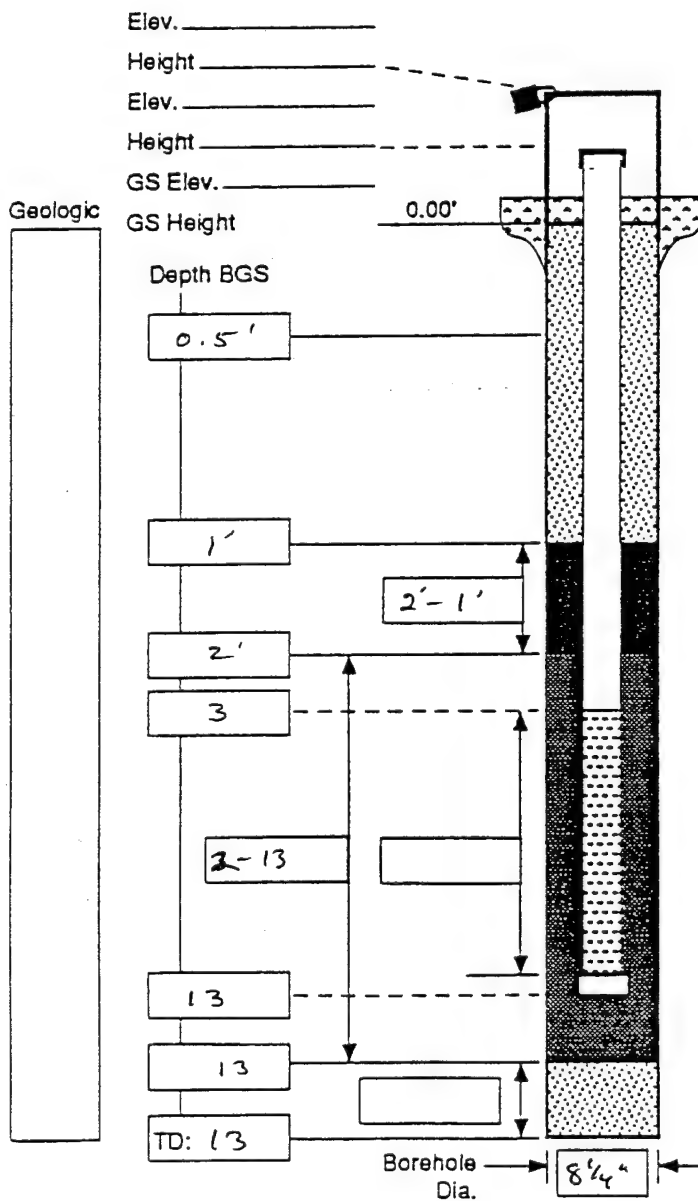
Material: JSB 9/21/93

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/21/93</u>
Well: <u>SIMW13</u>	Well ID: <u>SIMW13</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/8/93</u>	Depth to Water (ft): <u>~3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/10/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DRS/JSB</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: +2' - -3' BGS Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No. — Type: —

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): +2' - -3' BGS

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: hole plug 0.5-1'

Tremied (Y/N) (N) 0.5-1'

Interval BGS: —

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: bariumite pellets

Source: Baroid 2-1'

Setup / Hydration Time: — Vol. Fluid Added 5 gallon

Tremied (Y/N) (N)

## FILTER PACK

Type: Global Drilling #7

Amt. Used: 6-50# bags

Tremied (Y/N) (N)

Source: Global Drilling Supplies

Gr. Size Dist.: —

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3-13

## WELL FOOT (Y/N)

Interval BGS: — Length: —

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: JSB 9/21/93

Setup / Hydration Time: —

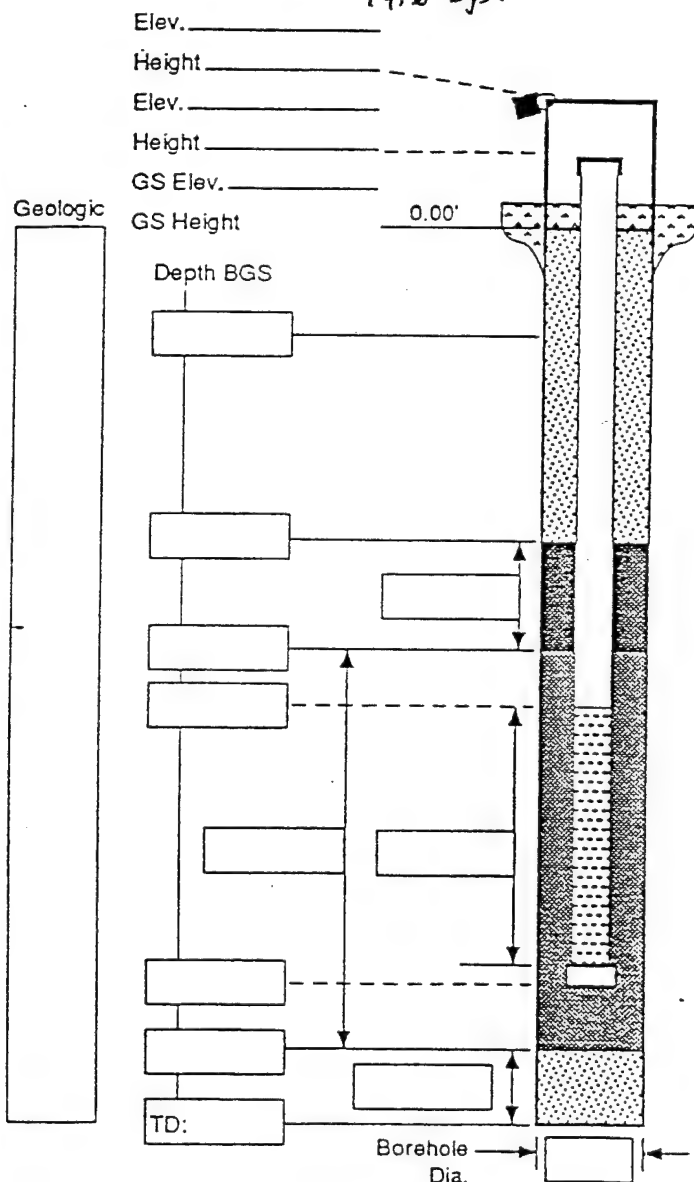
Tremied (Y/N) (N)



# Monitoring Well Construction Log - Above Ground

Project Name: <b>Phelps Collins ANG</b>	Project Number: <b>981800</b>	Date: <b>9/11/93</b>
Well: <b>SIMW14</b>	Well ID: <b>SIMW14</b>	Sheet: <b>1</b> of <b>1</b>
Driller: <b>D. Giffels</b>	Borehole Diameter (in): <b>14 1/4" O.D. to 14.0 BGS</b> <b>8 1/4" O.D. to 30'</b>	Total Depth (ft): <b>30'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>9/10/93</b>	Depth to Water (ft): <b>~3</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>9/11/93</b>	Elevation and Datum:
Drilling Method: <b>Hollow Stem Auger</b>	Logged by: <b>DP Payne</b>	Checked by: <b>JS Buehl</b>
Drilling Fluid: <b>None</b>	Number of Samples: <b>1</b>	Date: <b>-</b>

Note: set surface casing of 10 1/4" I.D. PVC from 1.5' above ground to 14.0' BGS.



borehole 0-14' BGS 10 1/4" I.D.  
surface casing

## PROTECTIVE CSG

Material / Type: **Steel Casing**  
Diameter: **4"**  
Depth BGS: **+2' - -2' BGS** Weep Hole (Y/N) **(N)**

## GUARD POSTS (Y/N)

No.: **3** Type: **Gdars**

## SURFACE PAD

Composition and Size: **2x2 Cement Pad**

## RISER PIPE

Type: **Schedule 40 PVC** **DPJ**  
Diameter: **2"**  
Total Length (TOC to TOS): **10'**

## Ventilated Cap (Y/N)

## GROUT

Composition and Proportions: **Cement (Type I) / bentonite 16 - 0.5' BGS**

## Tremied (Y/N)

Interval BGS: **16 - 0.5'**

## CENTRALIZERS

Depth(s): **N/A**

## SEAL

Type: **Baroid Bentonite Seal - liquid \***  
Source: **18 - 16' BGS**

Setup / Hydration Time: Vol. Fluid Added:

## Tremied (Y/N) DPJ

## FILTER PACK

Type: **Globe Filter Pack #7**  
Amt. Used: **6 / 50 lb bags**

Tremied (Y/N) **30 - 18**

Source: **Global Drilling supplies**

## Gr. Size Dist:

## SCREEN

Type: **Schedule 40 PVC**  
Diameter: **2"**

Slot Size and Type: **0.010"**

Interval BGS: **30' - 20'**

## WELL FOOT (Y/N)

Interval BGS: Length:

## Bottom Cap (Y/N)

## BACKFILL PLUG

Material: **JSB 9/21/93**

Setup / Hydration Time:

## Tremied (Y/N)

Filter pack from 30' - 18.5' BGS

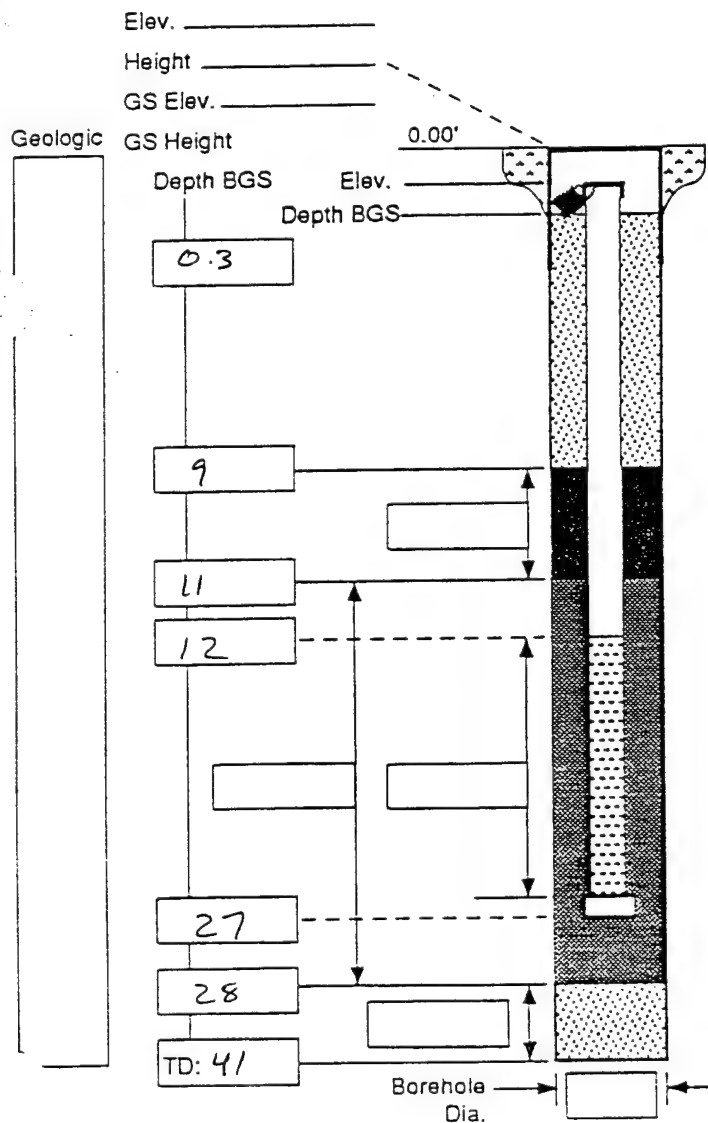
Form F-1024

C-104

\* Note: Drillers could not get pellets to sink even using tremie pipe + spotting on top of sand pack. They mixed a thick, liquid benton. seal.

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/16/93</u>
Well: _____	Well ID: <u>MP3mw6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>42'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/16/93</u>	Depth to Water (ft): _____
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/16/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFJ</u>	Checked by: <u>PHCag</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: DFJ

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y / N) \_\_\_\_\_

GUARD POSTS (Y / N) \_\_\_\_\_

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): \_\_\_\_\_

Ventilated Cap (Y / N) \_\_\_\_\_

## GRGUT

Composition and Proportions: \_\_\_\_\_

## Tremied (Y / N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): \_\_\_\_\_

## SEAL

Type: \_\_\_\_\_

Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_

## Tremied (Y / N)

## FILTER PACK

Type: Global #7

Amt. Used: 7 / 50 lbs bags

Tremied (Y / N) \_\_\_\_\_

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 12'-27'

## WELL FOOT (Y / N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y / N) \_\_\_\_\_

## BACKFILL PLUG

Material: Hole Plug 28'-27'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y / N) \_\_\_\_\_

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/17/93</u>
Well	Well ID: <u>MP2 MW7</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>15</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/17/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/17/93</u>	Elevation and Datum: <u>PH/Lay</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFJ</u>	Checked by:
Drilling Fluid: <u>None</u>	Number of Samples:	Date:

## PROTECTIVE CSG

Material / Type: DFJ  
 Diameter: 2"  
 Depth BGS: 7/22/93 Weep Hole (Y/N)

## GUARD POSTS (Y/N)

No.: Type:

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOG to TOS): 5'  
 Ventilated Cap (Y/N)

## GROUT

Composition and Proportions: Grout/cement-bentonite mixture

Tremied (Y/N)

Interval BGS:

## CENTRALIZERS

Depth(s): DFJ 7/21/93

## SEAL

Type: DFJ  
 Source: 8/21/93  
 Setup / Hydration Time: Vol. Fluid Added

Tremied (Y/N)

## FILTER PACK

Type: Global #7  
 Amt. Used: 7 - 50 lb bags  
 Tremied (Y/N)  
 Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: schedule 40 PVC  
 Diameter: 2"  
 Slot Size and Type: 0.010"  
 Interval BGS: 5'-15' BGS

## WELL FOOT (Y/N)

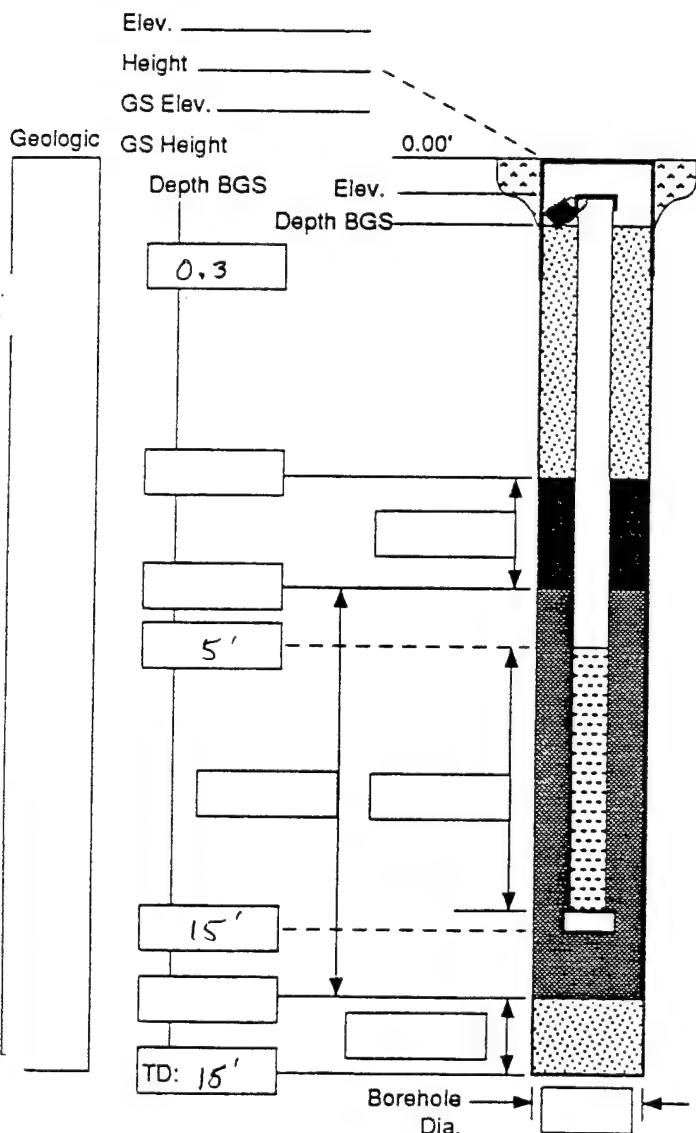
Interval BGS: Length:

Bottom Cap (Y/N)

## BACKFILL PLUG

Material: DFJ  
 Setup / Hydration Time:  
 Tremied (Y/N)

Form F-1023  
9/1/91



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/25/93</u>
Well: <u>CG3 MW6</u>	Well ID: <u>CG3 MW6</u>	Sheet <u>    </u> of <u>    </u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4"</u>	Total Depth (ft): <u>    </u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/25/93</u>	Depth to Water (ft): <u>-15</u>
Drilling Equipment: <u>CMG 750</u>	Date Finished: <u>8/30/93</u>	Elevation and Datum: <u>    </u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB</u>	Checked by: <u>PHL</u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>    </u>	Date: <u>9/22/93</u>

~~PROTECTIVE CSG~~  
Material / Type: JSB 8/25/93  
Diameter:       
Depth BGS:      Weep Hole (Y/N)       
GUARD POSTS (Y/N)       
No.:      Type:     

~~SURFACE PAD~~  
Composition and Size:     

~~RISER PIPE~~  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 23-0'  
Ventilated Cap (Y/N)       
GROUT  
Composition and Proportions:     

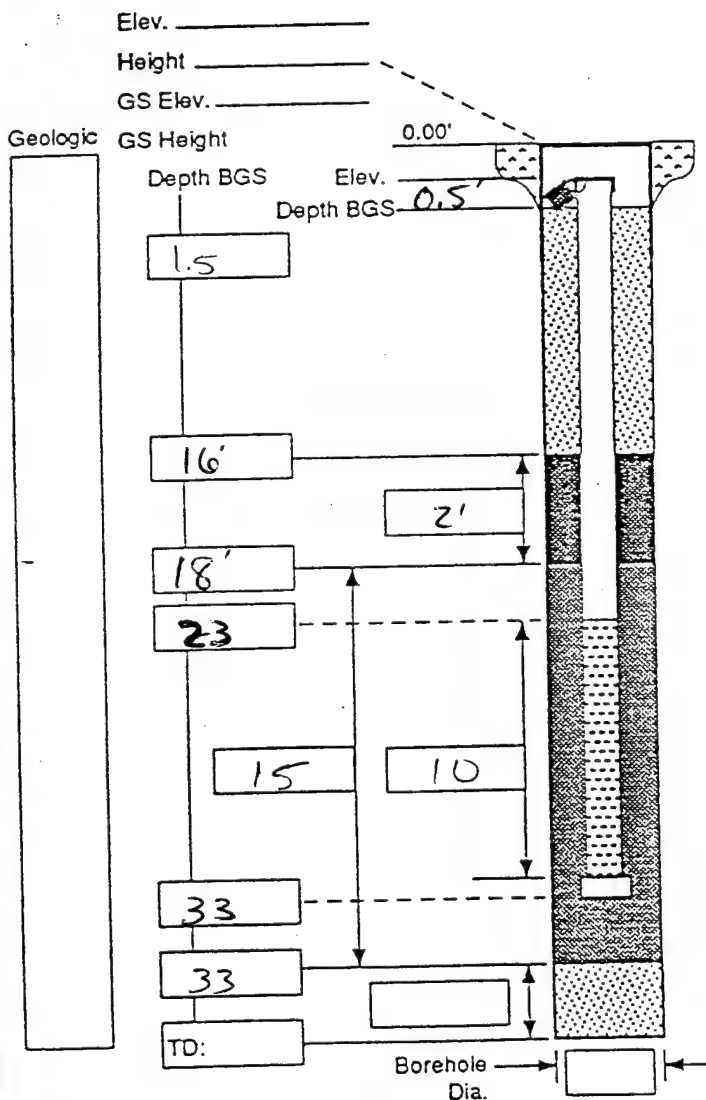
~~Tremied (Y/N)~~  
Interval BGS:     

~~CENTRALIZERS~~  
Depth(s): none

~~SEAL~~  
Type:       
Source:       
Setup / Hydration Time:      Vol. Fluid Added:     

~~Tremied (Y/N)~~  
FILTER PACK  
Type: Global Drilling Supplies #7  
Amt. Used:       
Tremied (Y/N)      Global Drilling Supplies #7  
Source:     

~~Gr. Size Disl:~~  
SCREEN  
Type: Schedule 40 PVC  
Diameter: 2"  
Slot Size and Type: 0.010  
Interval BGS: 23-23  
WELL FOOT (Y/N)       
Interval BGS:      Length:       
Bottom Cap (Y/N)       
BACKFILL PLUG  
Material: none  
Setup / Hydration Time:       
Tremied (Y/N)     



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/30/93</u>
Well	Well ID: <u>CG3mw7</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>35'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/30/93</u>	Depth to Water (ft): <u>14'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/31/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>PHL</u>	Checked by: <u>JSR</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>0</u>	Date: <u>9/22/93</u>

## PROTECTIVE CSO

Material / Type:

Diameter: N/A

Depth BGS: \_\_\_\_\_ Weep Hole (Y / N)

## GUARD POSTS (Y / N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: 2x2' concrete pad

## RISER PIPE

Type: PVC Sched 40

Diameter: 2" ID

Total Length (TOC to TOS): 0.3' to 12'

Ventilated Cap (Y / N)

## GROUT

Composition and Proportions: \_\_\_\_\_

Tremied (Y / N)

Interval BGS: 0.3 to 8'

## CENTRALIZERS

Depth(s): NA

## SEAL

Type: Bentonite pellets

Source: Global Drilling Supplies

Setup / Hydration Time: 30 minutes Vol. Fluid Added: 5 gal

Tremied (Y / N)

## FILTER PACK

Type: Global #7 silica sand

Amt. Used: 5 - 50# Bags

Tremied (Y / N)

Source: Global Drilling Supplier

Gr. Size Dist: #7

## SCREEN

Type: PVC Schedule 40

Diameter: 2" ID

Slot Size and Type: 0.010"

Interval BGS: 12-22'

## WELL FOOT (Y / N)

Interval BGS: NA Length: \_\_\_\_\_

Bottom Cap (Y / N)

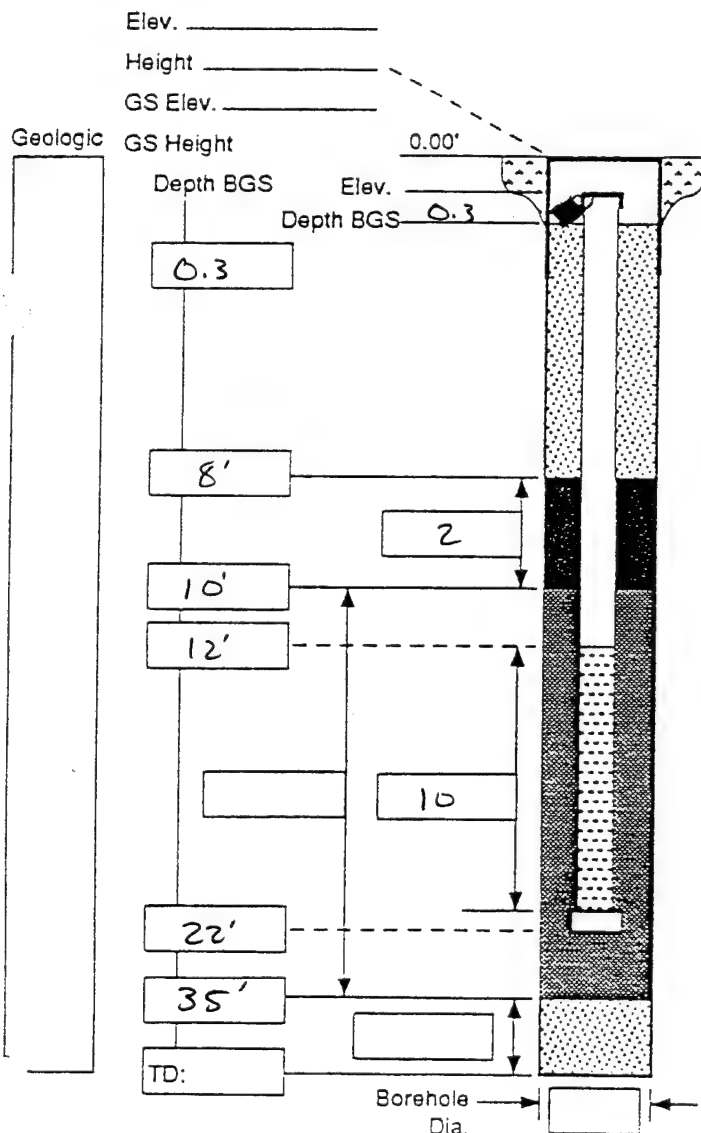
## BACKFILL PLUG

Material: cuttings / hole plug

Setup / Hydration Time: 30 minutes

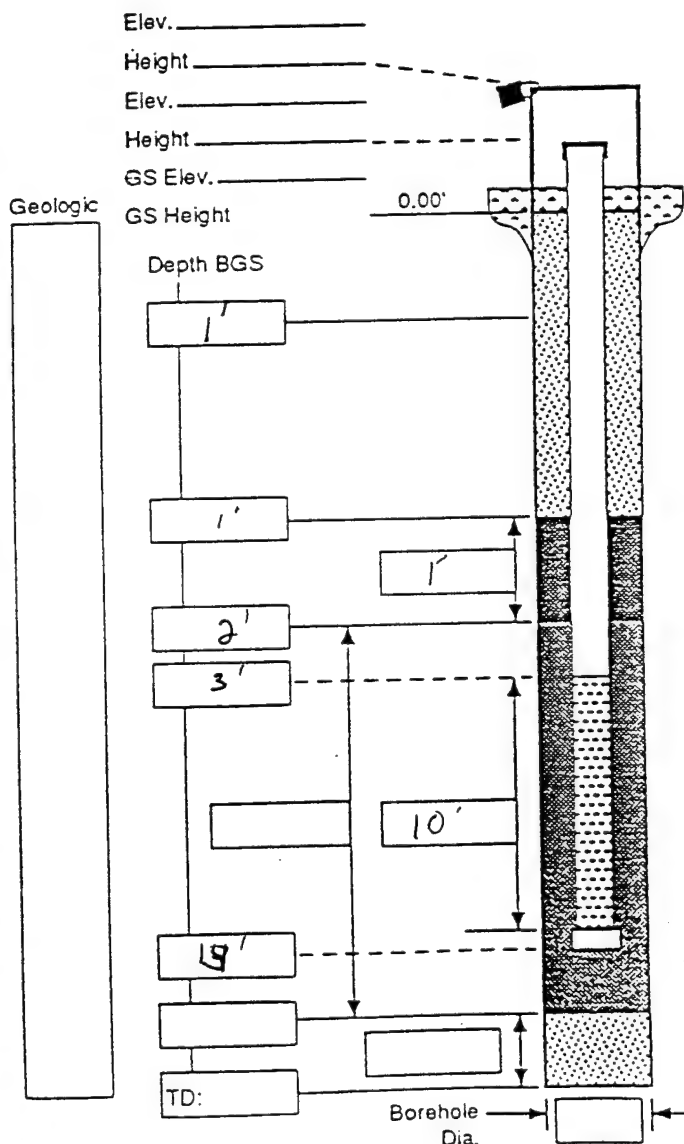
Tremied (Y / N)

Form E-1023  
9/1/91



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins AN6</u>	Project Number: <u>931800</u>	Date: <u>8/12/93</u>
Well:	Well ID: <u>SF5 MW5</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4"</u>	Total Depth (ft):
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/12/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/12/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DF Sample</u>	Checked by: <u>SSD</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: 4"

Diameter: 2"

Depth BGS: \_\_\_\_\_ Weep Hole ☒ (Y/N)

GUARD POSTS ☒ (Y/N)

No. 4 Type: Steel

SURFACE PAD

Composition and Size: Concrete 2' x 2'

RISER PIPE

Type: Schedule 40 2" PVC

Diameter: 2"

Total Length (TOC to TOS): 10'

Ventilated Cap ☒ (Y/N) J plug installed

GROUT

Composition and Proportions: hole plug - DES

Bentonite pellets

Tremied (Y/N)

Interval BGS: \_\_\_\_\_

CENTRALIZERS N/A

Depth(s): \_\_\_\_\_

SEAL Bentonite Pellets 8 - Grout

Type: \_\_\_\_\_

Source: \_\_\_\_\_ Vol. Fluid Added: 1 gallon

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N)

FILTER PACK

Type: Global Drilling Supplies

AML Used: 8 50lb bags

Tremied (Y/N) ☒

Source: \_\_\_\_\_

Gr. Size Dist: \_\_\_\_\_

SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 3'-14'

WELL FOOT (Y/N) ☒

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap ☒ (Y/N)

BACKFILL PLUG

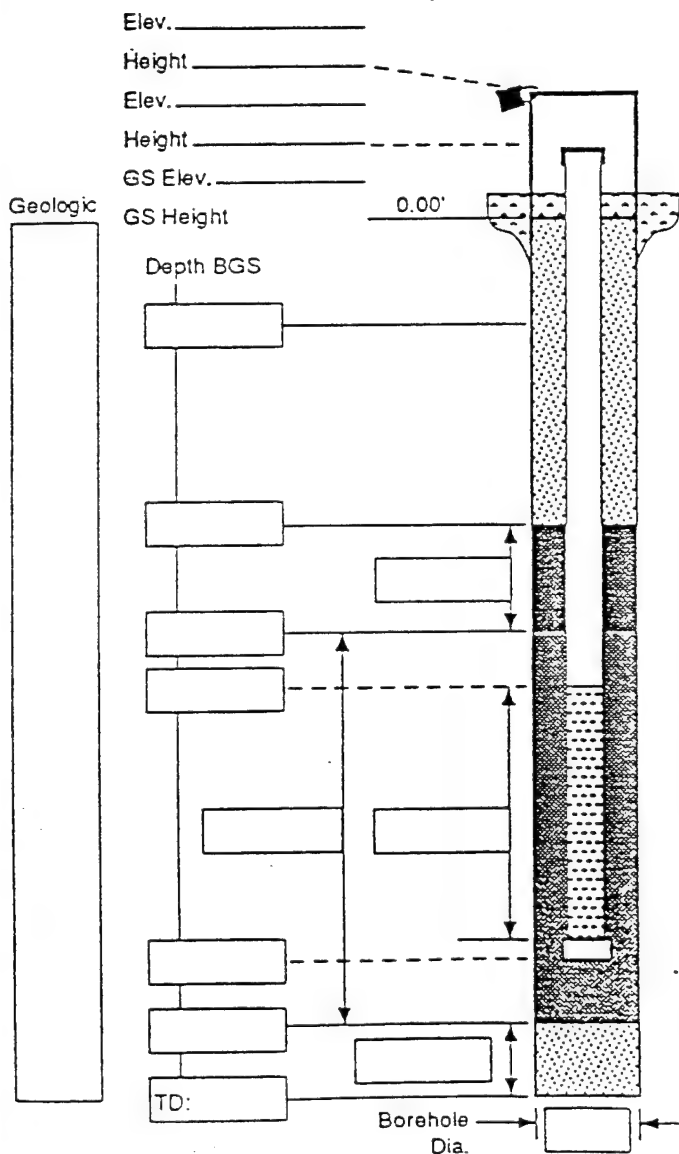
Material: DES

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) ☒

# Monitoring Well Construction Log - Above Ground

Project Name: <b>Phelps Collins ANG</b>	Project Number: <b>931806</b>	Date: <b>8/12/93</b>
Well:	Well ID: <b>SF5 MW 6</b>	Sheet: <b>1</b> of <b>1</b>
Driller: <b>Stearns D. Giffels</b>	Borehole Diameter (in):	Total Depth (ft): <b>21'</b>
Drilling Agency: <b>Stearns</b>	Date Started: <b>8/12/93</b>	Depth to Water (ft): <b>± 5'</b>
Drilling Equipment: <b>CME 750</b>	Date Finished: <b>8/12/93</b>	Elevation and Datum:
Drilling Method: <b>Hollow Stem Auger</b>	Logged by: <b>DF Jayne</b>	Checked by:
Drilling Fluid: <b>None</b>	Number of Samples:	Date:



## PROTECTIVE CSG

Material / Type:

Diameter:

Depth BGS: Weep Hole (Y/N)

## GUARD POSTS (Y/N)

No. Type:

## SURFACE PAD

Composition and Size:

## RISER PIPE

Type: **schedule 40 2" PVC**

Diameter: **2"**

Total Length (TOC to TOS):

Ventilated Cap (Y/N)

## GROUT

Composition and Proportions:

Tremied (Y/N)

Interval BGS:

## CENTRALIZERS

Depth(s): **None**

## SEAL

Type: **Bentonite Pellets**

Source:

Setup / Hydration Time: Vol. Fluid Added

Tremied (Y/N)

## FILTER PACK

Type: **Global Drilling Supplies**

AmL Used: **9 50/lb bags**

Tremied (Y/N)

Source:

Gr. Size Dist:

## SCREEN

Type: **schedule 40 PVC**

Diameter: **2"**

Slot Size and Type: **0.010"**

Interval BGS:

WELL FOOT (Y/N)

Interval BGS: Length

Bottom Cap (Y/N)

## BACKFILL PLUG

Material:

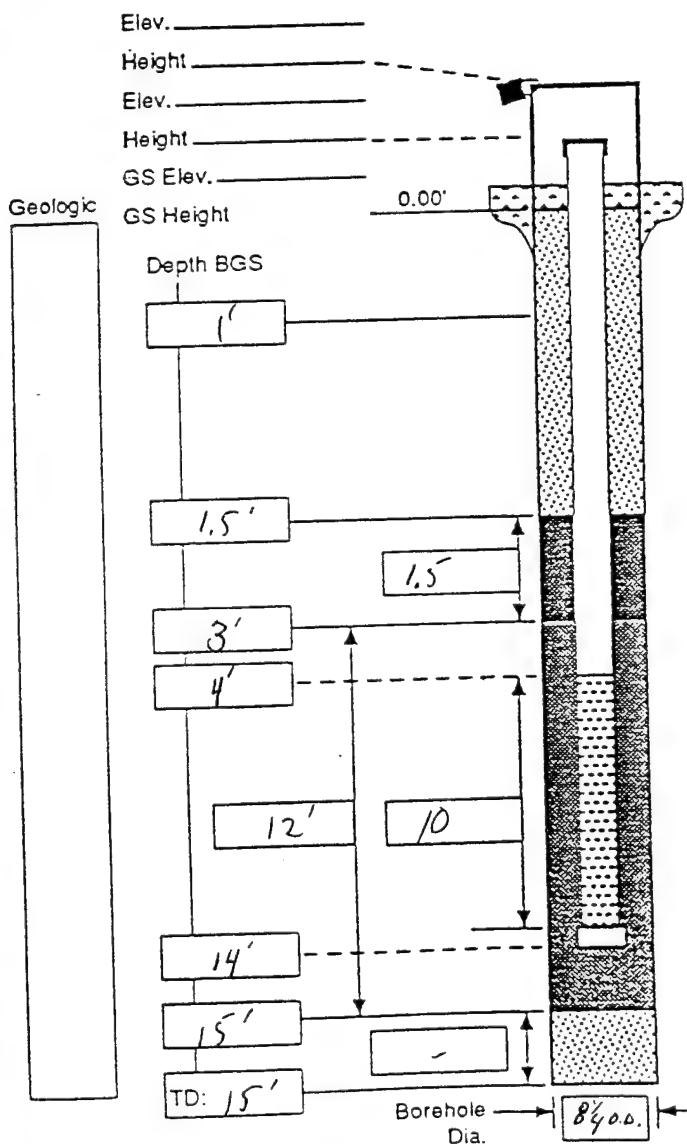
Setup / Hydration Time:

Tremied (Y/N)

Form F-1024

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/12/93</u>
Well: _____	Well ID: <u>SFS-MW7</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>7 1/4" p.d.</u>	Total Depth (ft): <u>15</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/12/93</u>	Depth to Water (ft): _____
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/12/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow stem Auger</u>	Logged by: <u>JSBriegel</u>	Checked by: <u>DEF</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: <u>9/22/93</u>



PROTECTIVE CSG  
Material / Type: 4"  
Diameter: 2'  
Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS 81M  
No. 4 Type: Steel

SURFACE PAD  
Composition and Size: Concrete 2'x2'

RISER PIPE  
Type: Schedule 40 PVC  
Diameter: 2"  
Total Length (TOC to TOS): 10'  
Ventilated Cap (Y/N) \_\_\_\_\_

GROUT  
Composition and Proportions: Cement/bentonite

Tremied (Y/N) \_\_\_\_\_  
Interval BGS: \_\_\_\_\_

CENTRALIZERS  
Depth(s) None

SEAL DEF  
Type: Bentonite Holeplug 21'-15' (2 50lb bags)  
Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: \_\_\_\_\_  
Tremied (Y/N) \_\_\_\_\_

FILTER PACK  
Type: Global Drilling Supplies #7  
Amt. Used: 7 50lb bags

Tremied (Y/N) \_\_\_\_\_  
Source: 15'-3'

Gr. Size Dist.: \_\_\_\_\_  
SCREEN Schedule 40 PVC

Type: 2"  
Diameter: 2"

Slot Size and Type: 0.010"  
Interval BGS: 14'-4'

WELL FOOT (Y/N) \_\_\_\_\_  
Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_  
BACKFILL PLUG DEF

Material: \_\_\_\_\_  
Setup / Hydration Time: 9/22/93  
Tremied (Y/N) \_\_\_\_\_

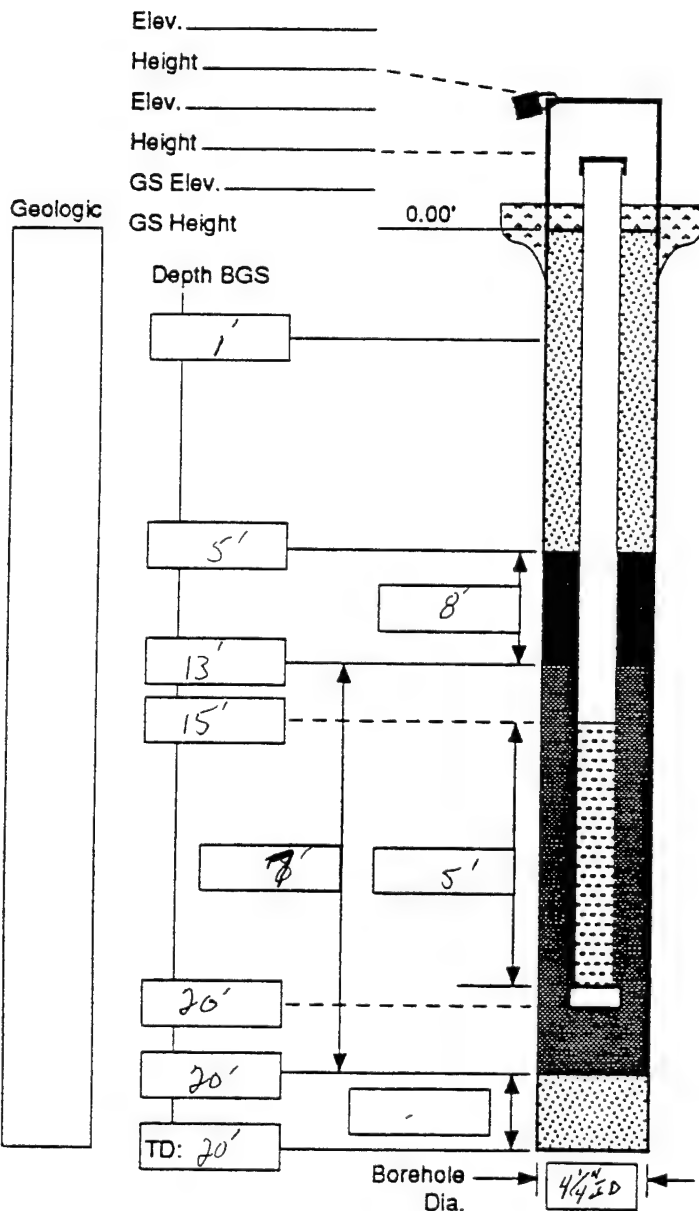
Form F-1024

3'-1 1/2' Bentonite pellets



# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/31/93</u>
Well	Well ID: <u>DEF</u> <u>LEGMW 8 SFSMW 8</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. G. ffels</u>	Borehole Diameter (in): <u>8 1/4" O.P.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/31/93</u>	Depth to Water (ft):
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/31/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JS/Briggs</u>	Checked by: <u>DRJ</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>



## PROTECTIVE CSG

Material / Type: 4"  
 Diameter: 4"  
 Depth BGS: 2' Weep Hole (Y/N) (Y)  
 GUARD POSTS (Y/N) (Y)  
 No.: 4 Type: Steel

## SURFACE PAD

Composition and Size: Concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"  
 Total Length (TOG to TOS): 17'  
 Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: Bentonite

## Tremied (Y/N)

Interval BGS: 0-5'

## CENTRALIZERS

Depth(s):

## SEAL

Type: Bentonite pellets

Sources:

Setup / Hydration Time: Vol. Fluid Added:

## Tremied (Y/N)

## FILTER PACK

Type: Global #7

Amt. Used: 3/50lb bags

Tremied (Y/N) (Y)

Source: Global Drilling Supplies

## Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.075"

Interval BGS: 15'-20' BGS

## WELL FOOT (Y/N)

Interval BGS: Length:

## Bottom Cap (Y/N)

## BACKFILL PLUG

Material:

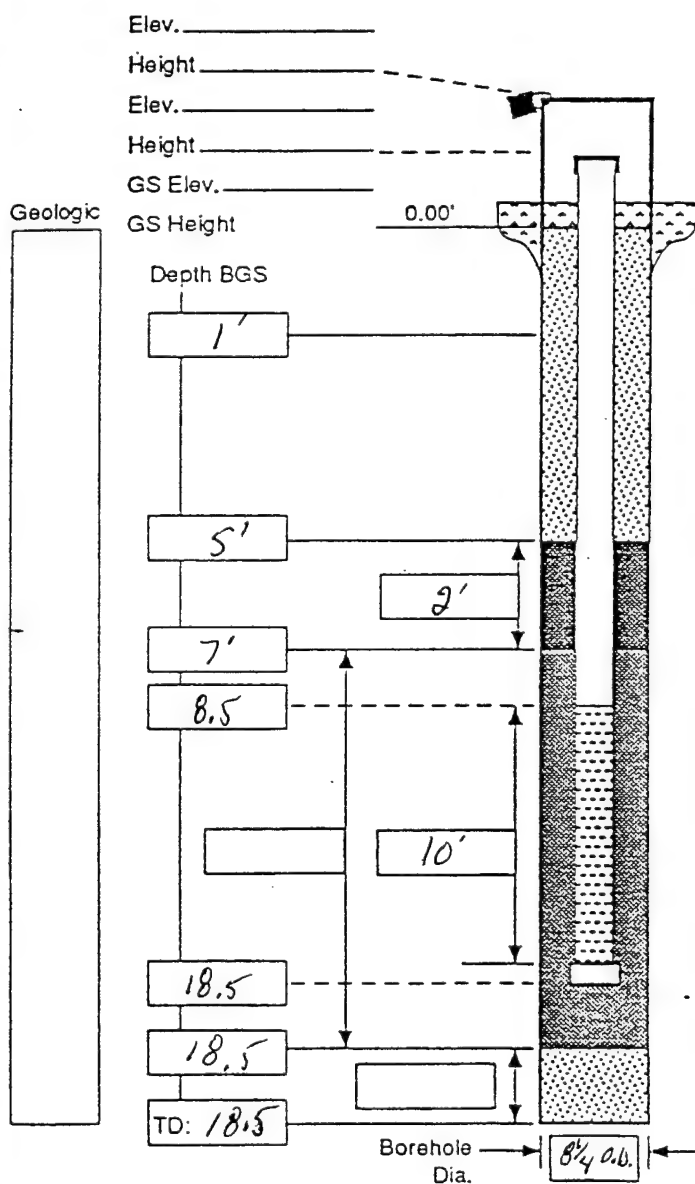
Setup / Hydration Time:

Tremied (Y/N) (Y)

DRJ  
9/22/93

## Monitoring Well Construction Log - Above Ground

Project Name: Phelps Collins AWC	Project Number: 931800	Date: 9/10/93
Well SF5MW9 (SF5TW9)	Well ID: SF5MW9	Sheet 1 of 1
Driller: D. Giffels	Borehole Diameter (in): 8 1/4	Total Depth (ft): 18.5
Drilling Agency: Stearns Drilling	Date Started: 9/9/93	Depth to Water (ft): ~8
Drilling Equipment: CME 750	Date Finished: 9/10/93	Elevation and Datum:
Drilling Method: hollow stem auger	Logged by: DJS/JSB	Checked by: JFT
Drilling Fluid: none	Number of Samples: —	Date: 9/22/93



## PROTECTIVE CSG

Material / Type: Steel

Diameter: 4"

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

GUARD POSTS (Y/N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

SURFACE PAD

Composition and Size: \_\_\_\_\_

**RISER PIPE**

RISER PIPE  
 Type: Schedule 40 PVC

Type: 5000 40 PVC

Diameter: 2  
Total Length (TOC to TOS): 8.5

Ventilated Cap (Y/N)

GROUT

Composition and Proportions: hole plug

Trembled (Y / (N))

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s) N/A

## SEAL

Type: bentonite pellets

Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added \_\_\_\_\_

Tremied (Y / N)

FILTER PACK

Type: Global drilling supplies #7

AmL Used: \_\_\_\_\_

Trembled (Y (N)) \_\_\_\_\_

Source: Global drilling supplies

Gr. Size Dist.:

SCREEN

Type: Schedule 40 pvc

Diameter 2"

Slot Size and Type: 0.010

Interval BGS: 18.5 - 8.5

WELL FOOT (Y (M))

Interval BGS: \_\_\_\_\_ Length \_\_\_\_\_

Bottom Cap (Y) N)

BACKFILL PLUG

Material: N/A

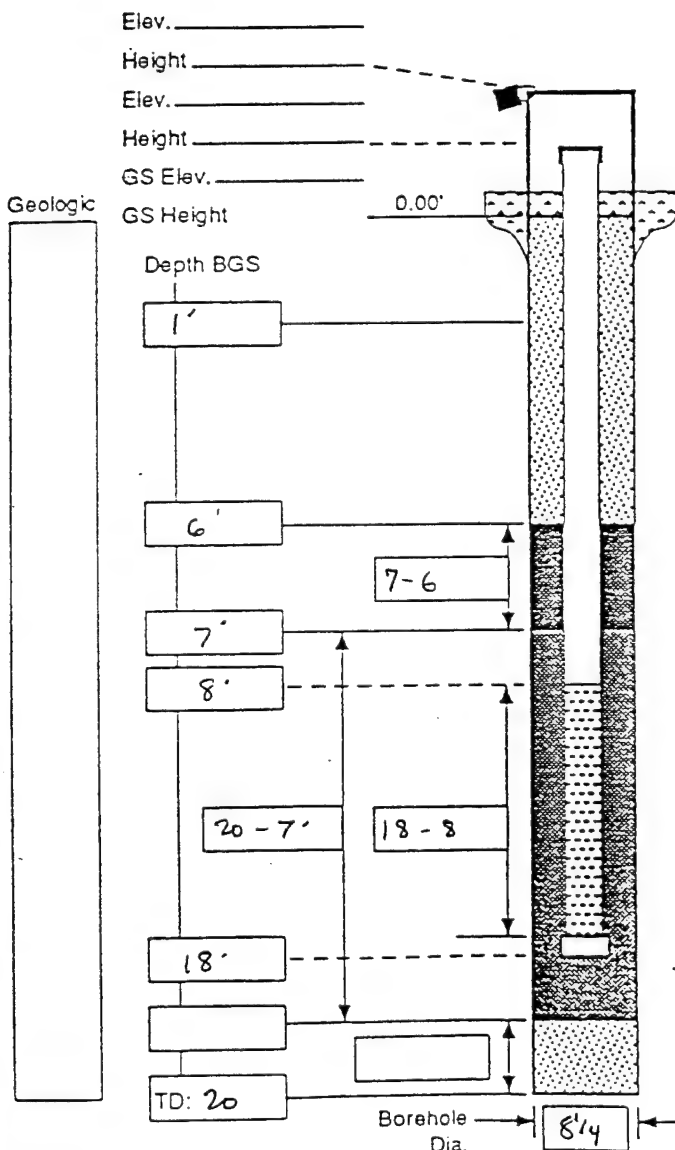
Setup / Hydration Time: \_\_\_\_\_

Form E-102

Form F-1024

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/11/93</u>
Well: <u>LF6MW4</u>	Well ID: <u>LF6MW4</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4"</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/11/93</u>	Depth to Water (ft): <u>~9.5'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/11/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>hollow stem auger</u>	Logged by: <u>JS Bruegel</u>	Checked by: <u>JSB.</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>



## PROTECTIVE CSG

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: +2 - -2' Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (Y/N)

No. 4 Type: steel/concrete

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 2" PVC

Diameter: 2"

Total Length (TOC to TOS): 10' (+8' - +2')

Ventilated Cap (Y/N) \_\_\_\_\_

## GROUT

Composition and Proportions: hole plug -

200 lb - Baroid

Tremied (Y/N) JS 9/22/93

Interval BGS: 7-6' 6'-1.0'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets - GEOSTORE

Source: Baroid - Kilman 7'-6'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5 gallon

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Global Drilling Supplies #7

AML Used: 7 50# bags

Tremied (Y/N) 20'-7'

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 18'-8'

WELL FOOT (Y/N) \_\_\_\_\_

Interval BGS: \_\_\_\_\_ Length \_\_\_\_\_

Bottom Cap (Y/N) \_\_\_\_\_

## BACKFILL PLUG

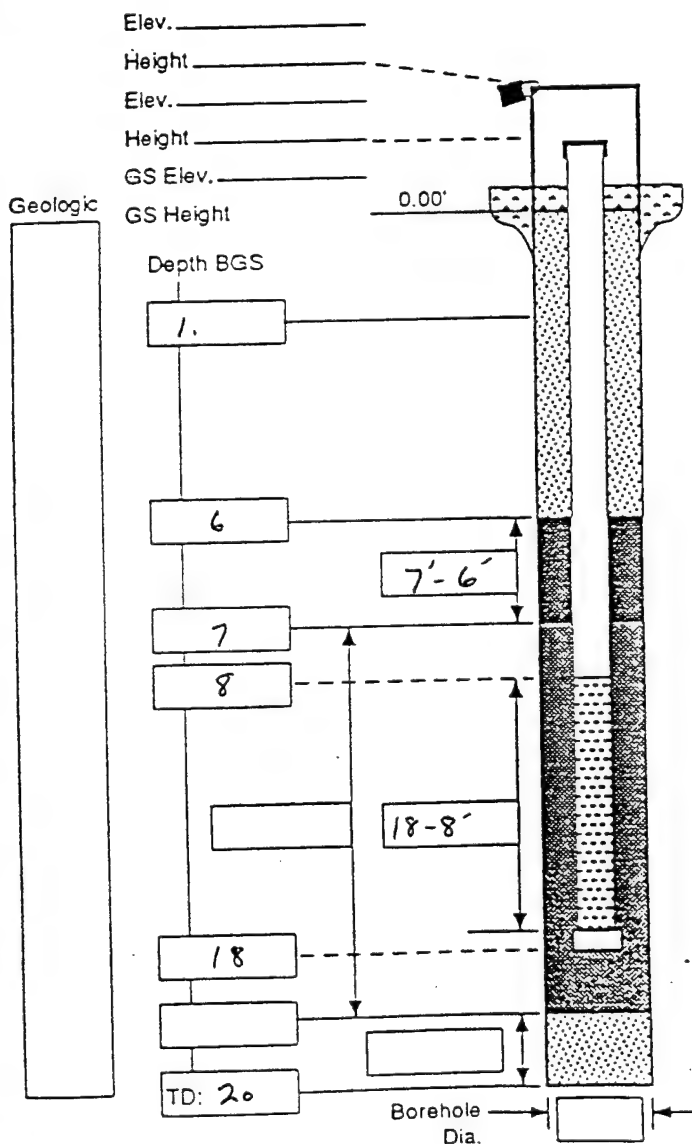
Material: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/11/93</u>
Well: <u>LF6MW5</u>	Well ID: <u>LF6MW5</u>	Sheet <u>    </u> of <u>    </u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4 I.D.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns Drilling</u>	Date Started: <u>8/11/93</u>	Depth to Water (ft): <u>    </u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/11/93</u>	Elevation and Datum: <u>    </u>
Drilling Method: <u>Stearns Drilling</u>	Logged by: <u>JS/Smayel</u>	Checked by: <u>    </u>
Drilling Fluid: <u>none</u>	Number of Samples: <u>    </u>	Date: <u>    </u>



PROTECTIVE CSG  
Material / Type: Steel casing  
Diameter: 4"  
Depth BGS: -2' - +2' Weep Hole (Y/N)     

GUARD POSTS (Y/N)       
No: 4 Type: steel / concrete - filled

SURFACE PAD  
Composition and Size: 2' x 2' concrete

RISER PIPE Schedule 40 PVC  
Type:       
Diameter: 2"  
Total Length (TOC to TOS): +2 to 8'  
Ventilated Cap (Y/N)     

GROUT  
Composition and Proportions: hole plug

Tremied (Y/N)      6'-1'  
Interval BGS:     

CENTRALIZERS N/A  
Depth(s):     

SEAL  
Type: pancrete pellets - Geostore  
Source: Brainerd K. Luman 7'-6'  
Setup / Hydration Time:      Vol. Fluid Added: 5 gallons

Tremied (Y/N)       
FILTER PACK  
Type: Global Drilling Supplies #7  
AML Used: 7-50 # bags  
Tremied (Y/N)      20'-7'  
Source: Global Drilling Supplies

Gr. Size Dist:     

SCREEN  
Type: Schedule 80 PVC  
Diameter: 2"  
Slot Size and Type: 0.010"  
Interval BGS: 8-18'

WELL FOOT (Y/N)       
Interval BGS:      Length:     

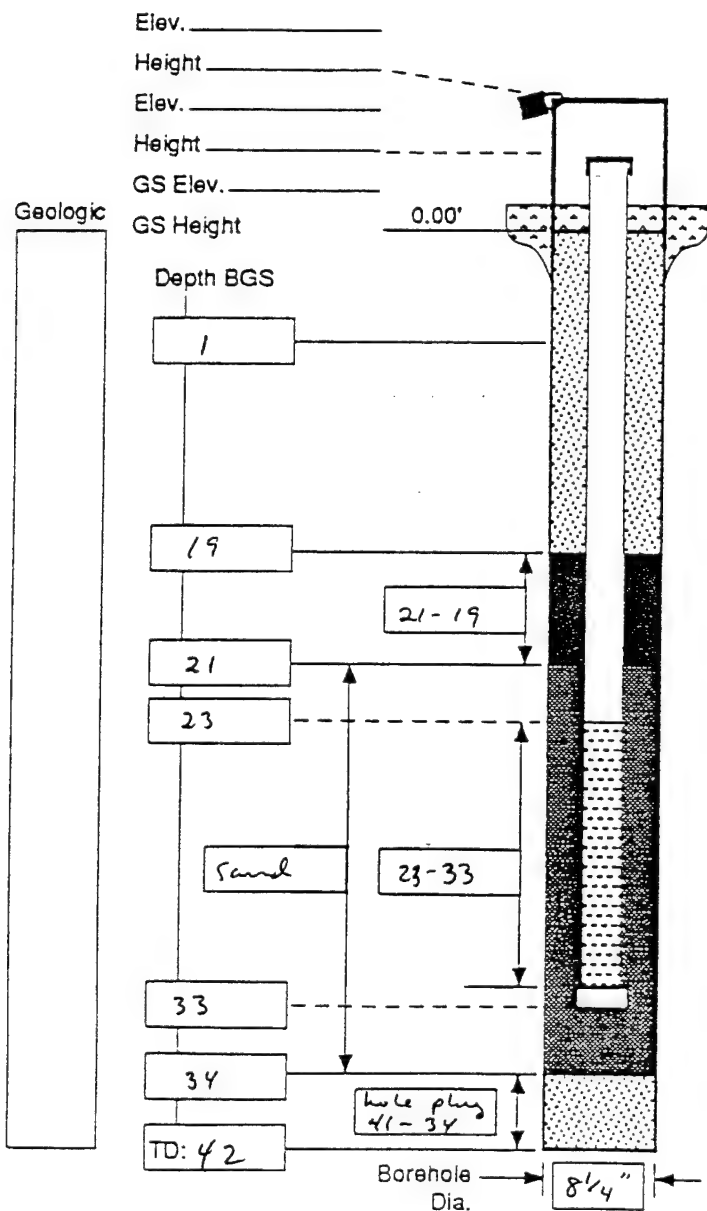
Bottom Cap (Y/N)     

BACKFILL PLUG  
Material: N/A  
Setup / Hydration Time:     

Tremied (Y/N)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LF6 MW6</u>	Well ID: <u>LF6 MW6</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>42'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/14/93</u>	Depth to Water (ft): <u>~14</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/14/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DFJ</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSG

Material / Type: Steel Casing

Diameter: 4"

Depth BGS: -2 to +2'

Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No.: 4

Type: steel / concrete - fill

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -23 to +2'

Ventilated Cap (Y/N) (Y)

## GROUT

Composition and Proportions: bentonite #9 - 1'

Tremied (Y/N) (N)

Interval BGS: 19 - 1'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets 21 - 19'

Source: Baroid (GEOSTORE)

Setup / Hydration Time: 5 Vol. Fluid Added

Tremied (Y/N) (N) gallons

## FILTER PACK

Type: Global #7

Amt. Used: 9 bags (50#)

Tremied (Y/N) (N) 34 - 21' BGS

Source: Global Drilling Supplies

Gr. Size Dist:

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010

Interval BGS: 23 - 33' BGS

## WELL FOOT (Y/N)

Interval BGS: Length

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: bentonite (hole plug)

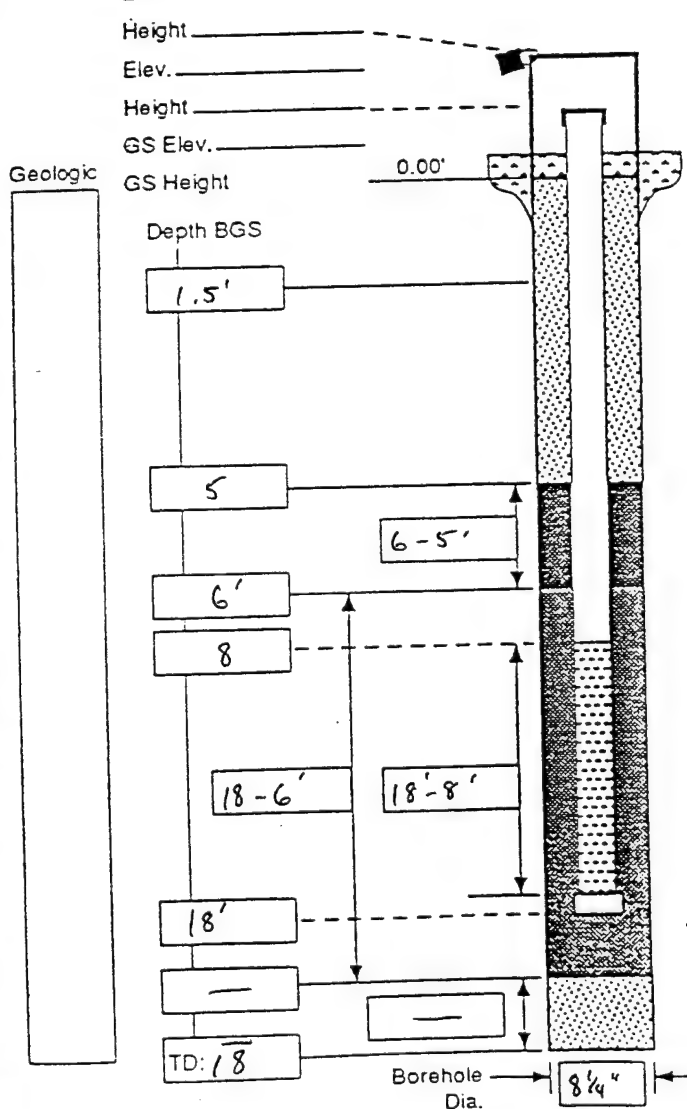
Setup / Hydration Time: 41 - 34'

Tremied (Y/N) (N) (through augers)

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>8/15/93</u>
Well: <u>LFG MW7</u>	Well ID: <u>LFG MW7</u>	Sheet: <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>4 1/4" I.D.</u>	Total Depth (ft): <u>18'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/15/93</u>	Depth to Water (ft): <u>8.7</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/15/93</u>	Elevation and Datum: <u>—</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DF Sayne</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>—</u>	Date: <u>—</u>

Abandoned 9/9/93 - ~4' to surface filled w/ hole plug



## PROTECTIVE CSO

Material/Type: Steel Casing

Diameter: 4"

Depth BGS: ~2 - +2'

Weep Hole ☒ (Y/N)

## GUARD POSTS ☒ (Y/N)

No.: 4

Type: steel/concrete filled

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -8 - +2'

Ventilated Cap ☒ (Y/N)

## GROUT

Composition and Proportions: grout/cement/bentonite

## Tremied ☒ (Y/N)

5 - 1.5'

Interval BGS: —

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Holeplug/pellets 6' - 5'

Source: Baroid

Setup / Hydration Time: — Vol. Fluid Added: 5 gallon

## Tremied ☒ (Y/N)

## FILTER PACK

Type: Global Filter pack

AML Used: 9 50lb bags interval 18' - 6' BGS

## Tremied ☒ (Y/N)

Source: Global Drilling Supplies

Gr. Size Dist: #7

## SCREEN

Type: Schedule 40

Diameter: 8" DFS 8" O.D. 4" DFS 2"

Slot Size and Type: 0.010"

Interval BGS: 18' - 8'

## WELL FOOT ☒ (Y/N)

Interval BGS: — Length: —

## Bottom Cap ☒ (Y/N)

## BACKFILL PLUG

Material: 355 11/1/93

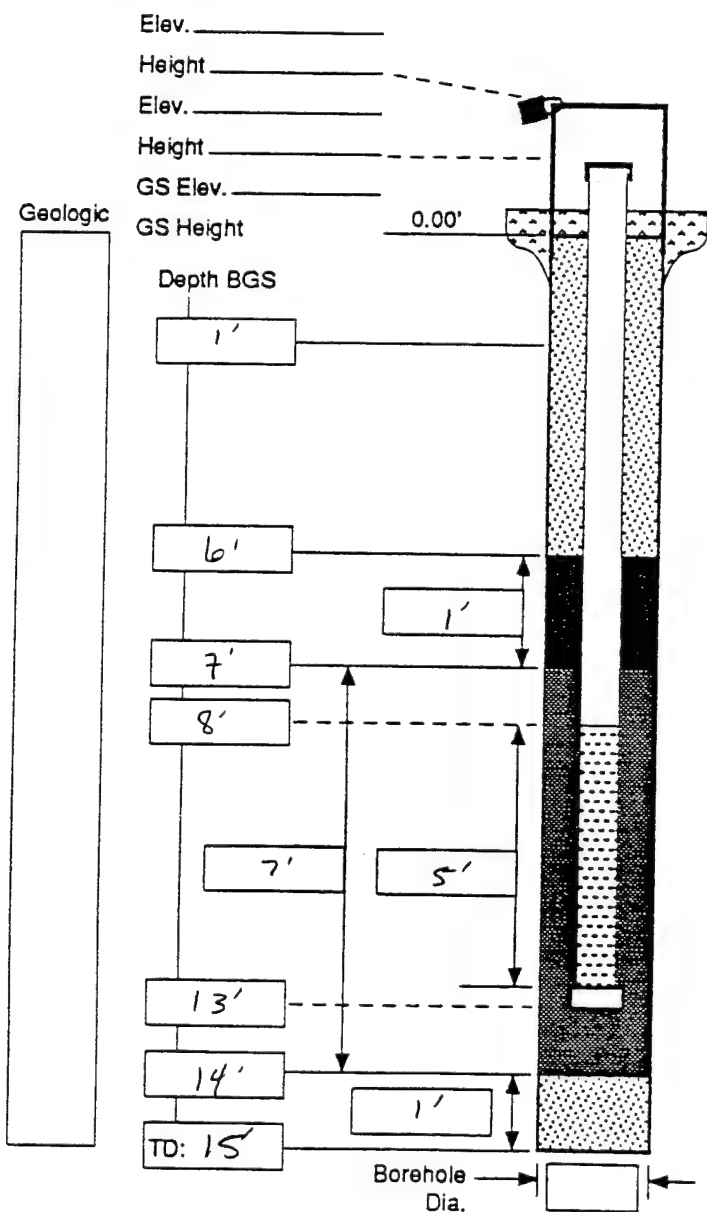
Setup / Hydration Time: —

Tremied ☒ (Y/N)

Form F-1024

# Monitoring Well Construction Log - Above Ground

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LFGMW8</u>	Well ID: <u>LFGMW8</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>15'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/27/93</u>	Depth to Water (ft): <u>~9</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/27/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/MCS</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>



## PROTECTIVE CSQ

Material / Type: steel casing

Diameter: 4"

Depth BGS: -2' to +2' Weep Hole (Y/N) (N)

## GUARD POSTS (Y/N)

No.: 4 Type: concrete filled steel

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): -8' to +2'

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: Bentonite

## Tremied (Y/N)

Interval BGS: 6' - 1'

## CENTRALIZERS

Depth(s): N/A

## SEAL

Type: Bentonite pellets

Source: Baroid 7'-6'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gallons

Tremied (Y/N) (N)

## FILTER PACK

Type: Global #7

Amt. Used: 4 - 50 # bags

Tremied (Y/N) (N) 14' - 7' BGS

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0-010"

Interval BGS: 13' - 8'

WELL FOOT (Y/N) (N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (N)

BACKFILL PLUG

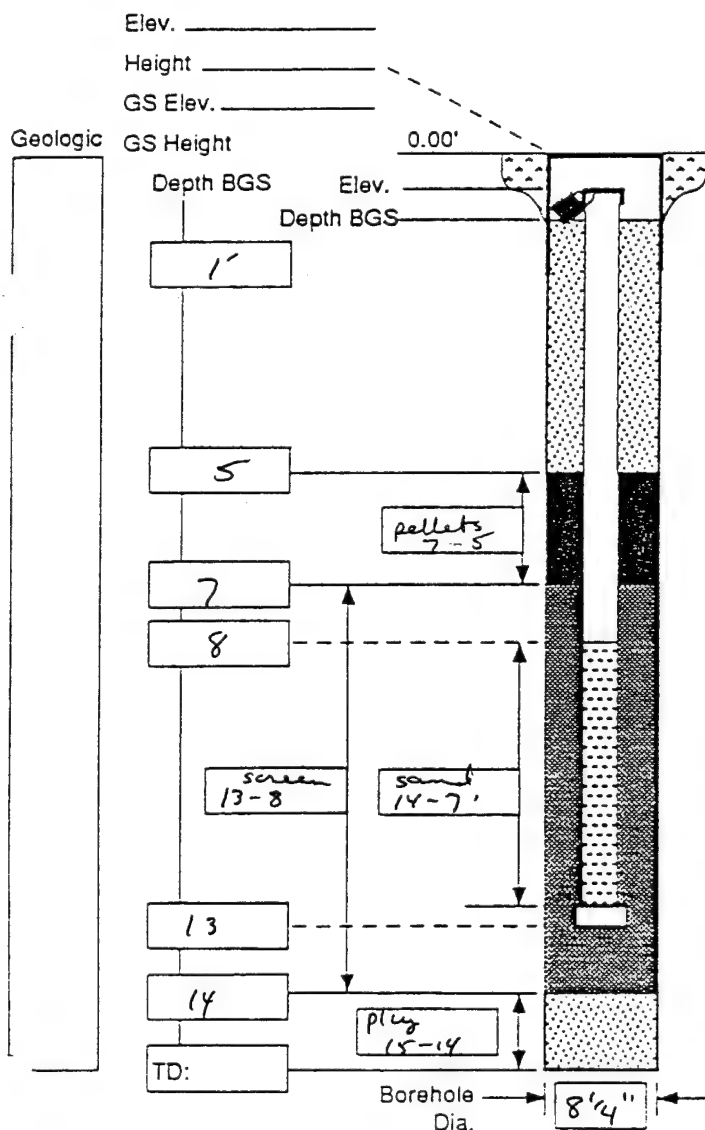
Material: hole plug (bentonite) 15' - 14'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) (N) through augers

# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: _____
Well: <u>LF6MW9</u>	Well ID: <u>LF6MW9</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>16'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/27/93</u>	Depth to Water (ft): <u>~10'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>8/28/93</u>	Elevation and Datum: _____
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>MES</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: _____	Date: _____



## PROTECTIVE CSG

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: -2 to +2' Weep Hole (Y/N) ☒

## GUARD POSTS (Y/N)

No.: 2 Type: concrete/steel  
550 9/22/93

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC  
 Diameter: 2"

Total Length (TOC to TOS): +2' to -8'

Ventilated Cap (Y/N) ☒

## GROUT

Composition and Proportions: bentonite  
-8' to -1' AGS

Tremied (Y/N) ☒

Interval BGS: 550 8' to 1'  
2/11/95

## CENTRALIZERS

Depth(s): NA

## SEAL

Type: Bentonite pellets  
 Source: Bovoid 7-5'

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added 5

Tremied (Y/N) ☒

## FILTER PACK

Type: Global #7

Amt. Used: 4 50# bags

Tremied (Y/N) ☒

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 13-8'

## WELL FOOT (Y/N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) ☒

## BACKFILL PLUG

Material: hole plug 15-14'

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) ☒



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/22/93</u>
Well: <u>LFGMW10</u>	Well ID: <u>LFGMW10</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>13'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/12/93</u>	Depth to Water (ft): <u>~9'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/13/93</u>	Elevation and Datum: <u>-</u>
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>JSB/DFS</u>	Checked by: <u>JSB</u>
Drilling Fluid: <u>None</u>	Number of Samples: <u>-</u>	Date: <u>-</u>

## PROTECTIVE CSG

Material / Type: Steel Casing  
 Diameter: 4"  
 Depth BGS: - 2' to + 2' Weep Hole (Y/N) -

## GUARD POSTS (Y/N)

No.: - Type: -

## SURFACE PAD

Composition and Size: concrete 2' x 2'

## RISER PIPE

Type: Schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): - 8' to + 2'

Ventilated Cap (Y/N) -

## GROUT

Composition and Proportions: JSN 9/22/93 hole plug concrete 3' - surface

Tremied (Y/N) -

Interval BGS: -

## CENTRALIZERS

Depth(s): NA

## SEAL

Type: bentonite 6' - 3'

Source: Burord

Setup / Hydration Time: - Vol. Fluid Added 15

Tremied (Y/N) - gallons

## FILTER PACK

Type: Global #7

Am't Used: 4 - 50 lb bags

Tremied (Y/N) - 13 - 6'

Source: Global Drilling supplies

Gr. Size Dist: -

## SCREEN

Type: Schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 13' - 8'

## WELL FOOT (Y/N)

Interval BGS: - Length: -

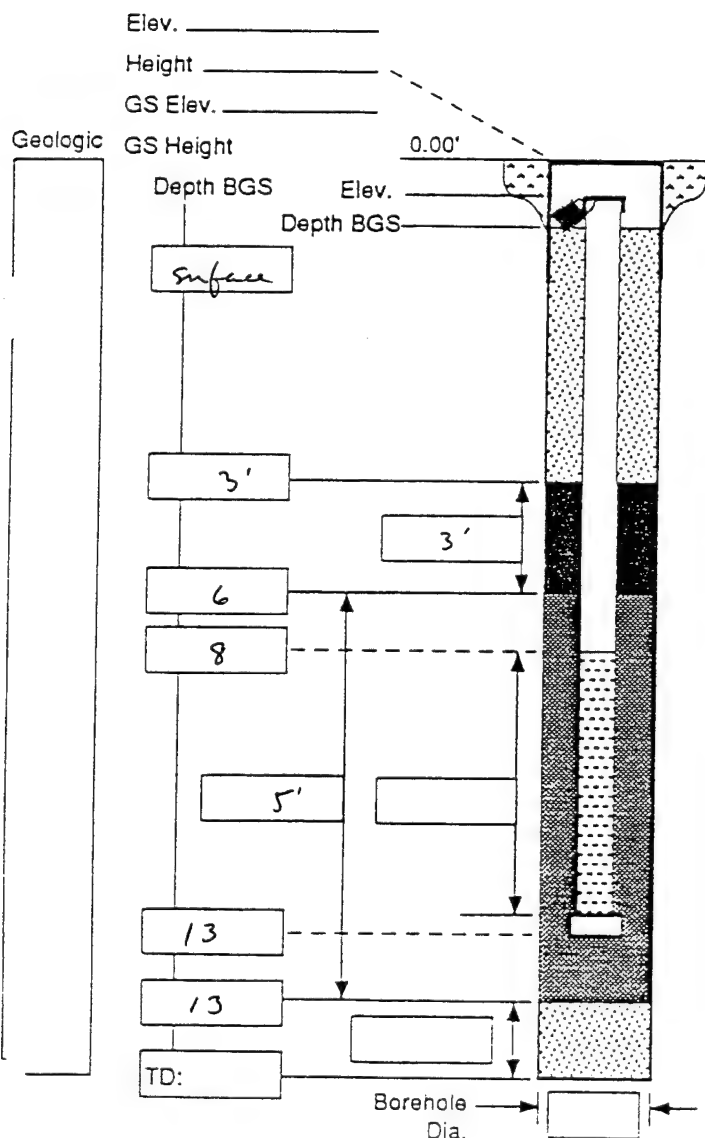
Bottom Cap (Y/N) -

## BACKFILL PLUG

Material: JSB 9/22/93

Setup / Hydration Time: -

Tremied (Y/N) - Form F-1023 9/1/91



## Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG</u>	Project Number: <u>931800</u>	Date: <u>9/11/93</u>
Well: <u>MWS</u>	Well ID: <u>HNBMWS</u>	Sheet <u>1</u> of <u>1</u>
Driller: <u>D. Giffels</u>	Borehole Diameter (in): <u>8 1/4" O.D.</u>	Total Depth (ft): <u>20'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>9/11/93</u>	Depth to Water (ft): <u>13'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished: <u>9/11/93</u>	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>DRS</u>	Checked by: <u>Patricia Ly</u>
Drilling Fluid: <u>None</u>	Number of Samples:	Date: <u>9/22/93</u>

### PROTECTIVE CSQ

Material / Type:

Diameter:

Depth BGS: DF Weep Hole (Y / N)

GUARD POSTS (Y / N)

No.: 7/21/93 Type:

### SURFACE PAD

Composition and Size: Concrete 2' x 2'

### RISER PIPE

Type: schedule 40 PVC

Diameter: 2"

Total Length (TOC to TOS): 10'

Ventilated Cap (Y / N)

### GROUT

Composition and Proportions: Bentonite 6' surface

Tremied (Y / N)

Interval BGS:

### CENTRALIZERS

Depth(s)

### SEAL

Type: bentonite 8'-6' BGS

Source:

Setup / Hydration Time: Vol. Fluid Added 10 gallons

Tremied (Y / N)

### FILTER PACK

Type: Global #17 silica SAND

Amt. Used: 7/5016 bags

Tremied (Y / N)

Source: Global Drilling Supplies 20'-8' BGS

Gr. Size Dist:

### SCREEN

Type: schedule 40 PVC

Diameter: 2"

Slot Size and Type: 0.010"

Interval BGS: 9.5'-19.5' BGS

### WELL FOOT (Y / N)

Interval BGS: Length:

Bottom Cap (Y / N)

### BACKFILL PLUG

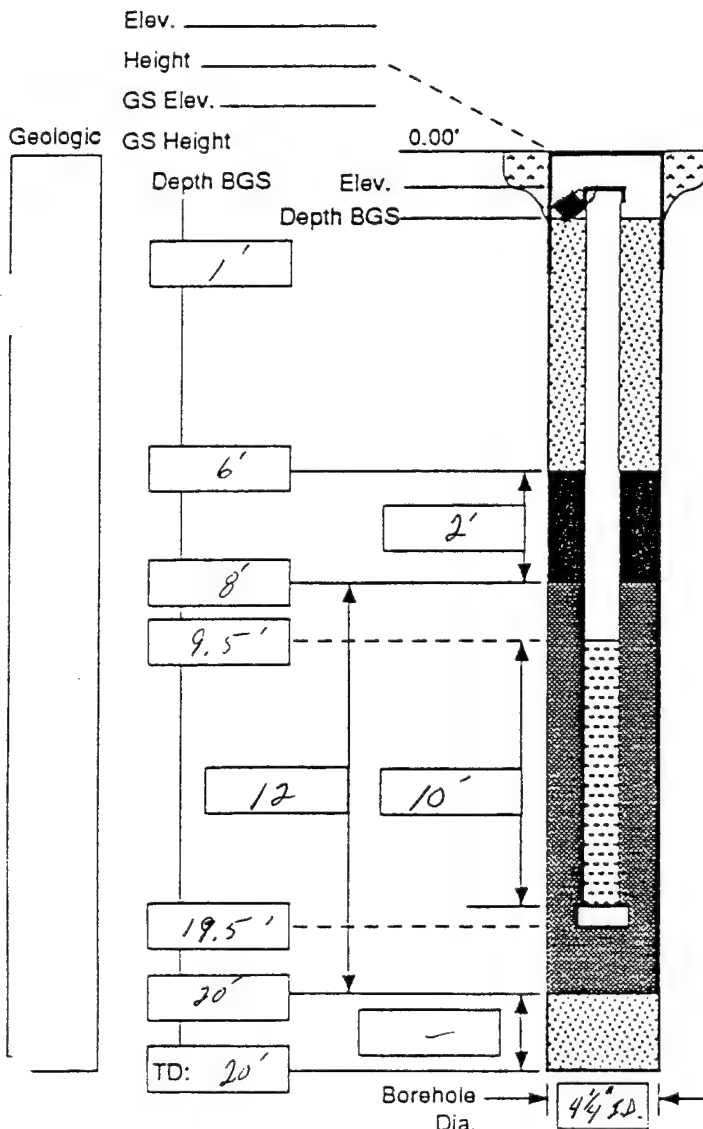
Material:

Setup / Hydration Time:

Tremied (Y / N)

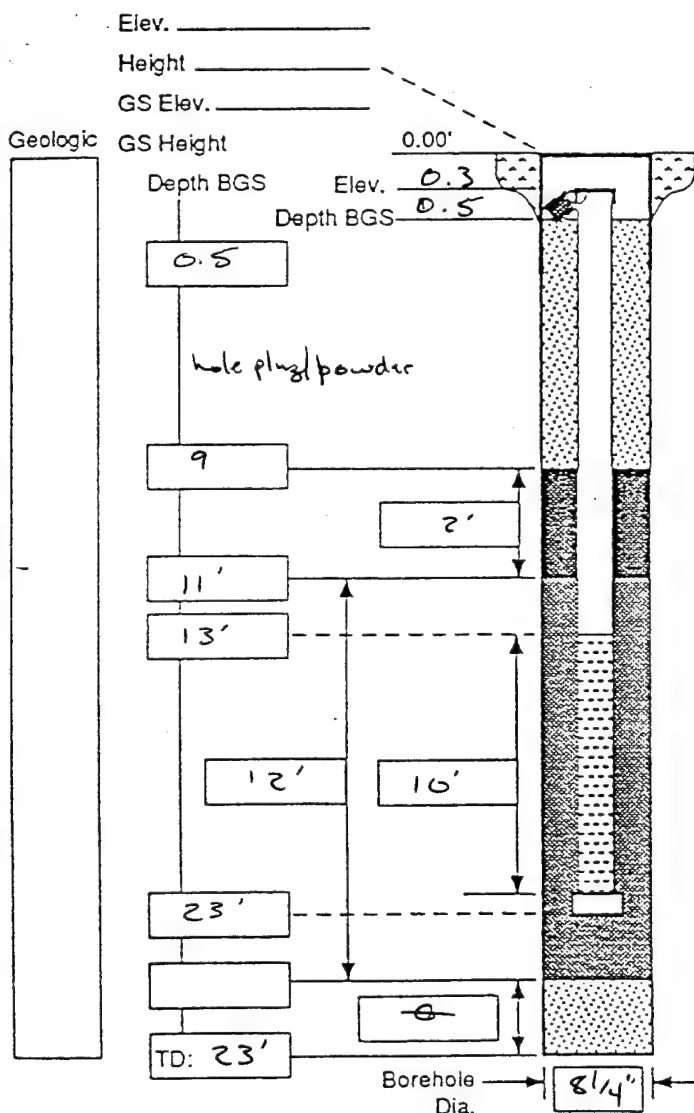
Form F-1023

9/1/91



# Monitoring Well Construction Log - Flush Mount

Project Name: <u>Phelps Collins ANG RI</u>	Project Number: <u>931800</u>	Date: <u>8/30/93</u>
Well location: <u>Site 9 Radar Tower</u>	Well ID: <u>MW6</u>	Sheet: <u>1 of 1</u>
Driller: <u>Dennis G. Ffels</u>	Borehole Diameter (in): <u>8 1/4"</u>	Total Depth (ft): <u>23'</u>
Drilling Agency: <u>Stearns</u>	Date Started: <u>8/30/93</u>	Depth to Water (ft): <u>~16.3'</u>
Drilling Equipment: <u>CME 750</u>	Date Finished:	Elevation and Datum:
Drilling Method: <u>Hollow Stem Auger</u>	Logged by: <u>P. H. Lag</u>	Checked by:
Drilling Fluid: <u>none</u>	Number of Samples: <u>—</u>	Date:



## PROTECTIVE CSG

Material / Type: Flushmount Steel

Diameter: \_\_\_\_\_

Depth BGS: \_\_\_\_\_ Weep Hole (Y/N) \_\_\_\_\_

## GUARD POSTS (N)

No.: \_\_\_\_\_ Type: \_\_\_\_\_

## SURFACE PAD

Composition and Size: 2x2' concrete

## RISER PIPE

Type: PVC Schedule 40

Diameter: 2" ID

Total Length (TOC to TOS): \_\_\_\_\_

Ventilated Cap (Y/N) (N)

## GROUT

Composition and Proportions: Portland Type I cement

Tremied (Y/N) (N)

Interval BGS: \_\_\_\_\_

## CENTRALIZERS

Depth(s): none

## SEAL

Type: Bentonite pellets / powder / hole plug

Source: \_\_\_\_\_

Setup / Hydration Time: \_\_\_\_\_ Vol. Fluid Added: 5 gal

Tremied (Y/N) \_\_\_\_\_

## FILTER PACK

Type: Silica Sand

AML Used: 7 bags

Tremied (Y/N) (N)

Source: Global Drilling Supplies

Gr. Size Dist: \_\_\_\_\_

## SCREEN

Type: PVC Schedule 40

Diameter: 2" ID

Slot Size and Type: 1/8" slot 0.010"

Interval BGS: 13-23'

## WELL FOOT (Y/N) (N)

Interval BGS: \_\_\_\_\_ Length: \_\_\_\_\_

Bottom Cap (Y/N) (N)

## BACKFILL PLUG

Material: n/a

Setup / Hydration Time: \_\_\_\_\_

Tremied (Y/N) \_\_\_\_\_

Form F-1025

## **Geotechnical Results**



# SUMMARY OF LABORATORY TEST RESULTS

Sample ID	Depth (ft)	Natural Moisture (%)	UNIT WEIGHT (PCF)		SPECIFIC GRAVITY	ATTERBERG LIMITS		Unified Soil Classification	Other Test **	Soil Description
			Wet	Dry		Liquid Limit (%)	Plasticity Index (%)			
P1 MW 10/ST-5	14.0 - 16.0	18.5	120.8	102.0	2.62	16	7	SM-SC	S,K	SAND, silty, clayey, brown
POS MW7/ST-3	18.0 - 20.0	14.1	138.9	121.8	2.76	12	6	SW	S,K	SAND, clayey, light brown with rock fragments
P3 B13/ST-1	53.0 - 55.0	19.7	108.7	90.8	2.75	21	11	CL	S,K	CLAY, silty, brown
LF6 MW7/ST-6	17.0 - 19.0	21.2	123.0	101.5	2.70	12	6	ML-CL	S,K	SILT, clayey, brown
P4 B15/ST-4	42.0 - 43.0	18.9			2.67	14	4	SM-SC	S	SAND, silty, clayey, brown Note: not enough sample for permeability
*P4 B15/ST-4	42.0 - 43.0	20.6	131.9	109.4	2.65	16	4	SM-SC	S,K	SAND, silty, clayey, brown
POZ B8/ST-2	55.0 - 56.0	17.8	137.9	117.1	2.70	30	16	CL	S,K	CLAY, silty, slightly sandy brown
*This is second attempt Shelby Tube Sample										

\*ST-SHELBY TUBE SAMPLE, SS-SPLIT SPOON SAMPLE, C-COMPOSITE SPLIT SPOON  
 \*\*TEST RESULTS REPORTED ON OTHER SHEETS:

K-PERMEABILITY  
 S-SIEVE OR GRAIN SIZE ANALYSIS  
 U-UNCONFINED COMPRESSION TEST

P-PROCTOR TEST

D-DIRECT SHEAR TEST  
 T-TRIAXIAL TEST

DATA CHECKED BY

GA Technical Services

# SUMMARY OF CONSTANT HEAD PERMEABILITY METHOD ASTM D5084-90

Project : Earth Tech Lab Testing  
Client : Earth Technology Corporation  
Project No. : 3-4424-0000  
Date : October 12, 1993

SAMPLE ID	SAMPLE LENGTH. in.	SAMPLE DIAMETER. in.	SAMPLE AREA. sq. ft.	DRY UNIT WT PCF	% MOISTURE	COEFFICIENT OF PERMEABILITY, cm/sec
P1MW10/ST-5 D14. - 16.	2.72	2.80	0.04276	102.0	18.5	$1.8 \times 10^{-4}$
POSMW7/ST-3 D18. - 20.	4.28	2.80	0.04276	121.8	14.1	$3.5 \times 10^{-5}$
P3 B13/ST-1 D53. - 55.	4.22	2.80	0.04276	90.8	19.7	$2.1 \times 10^{-6}$
LF6 MW7/ST-6 D17. - 19.	4.34	2.80	0.04276	101.5	21.2	$8.2 \times 10^{-6}$
*P4 B15/ST-4 D42. - 43.	3.41	2.80	0.04276	109.4	20.6	$1.4 \times 10^{-5}$
POZ B8/ST-2 D55. - 56.	4.16	2.80	0.04276	117.1	17.8	$1.2 \times 10^{-7}$

\*This is second attempt Shelby Tube Sample

SUMMARY OF CATION EXCHANGE CAPACITY  
METHOD EPA 9080

Project : Earth Tech Lab Testing  
Client : Earth Technology Corporation  
Project No. : 3-4424-0000  
Date : October 11, 1992

SAMPLE ID	TOTAL CATION EXCHANGE CAPACITY me/100g
P1MW10/ST-5 - D14. - 16.	40.9
POS MW7/ST-3 - D18. - 20.	15.6
P3 B13/ST-1-D 53. - 55.	24.2
LF6 MW7/ST-6-D17. - 19.	7.4
P4 B15/ST-4-D42.0 - 43.0	3.8
P4 B15/ST-4-D42.0 - 43.0	13.5
POZ B8/ST-2-D55. - 56.	29.2

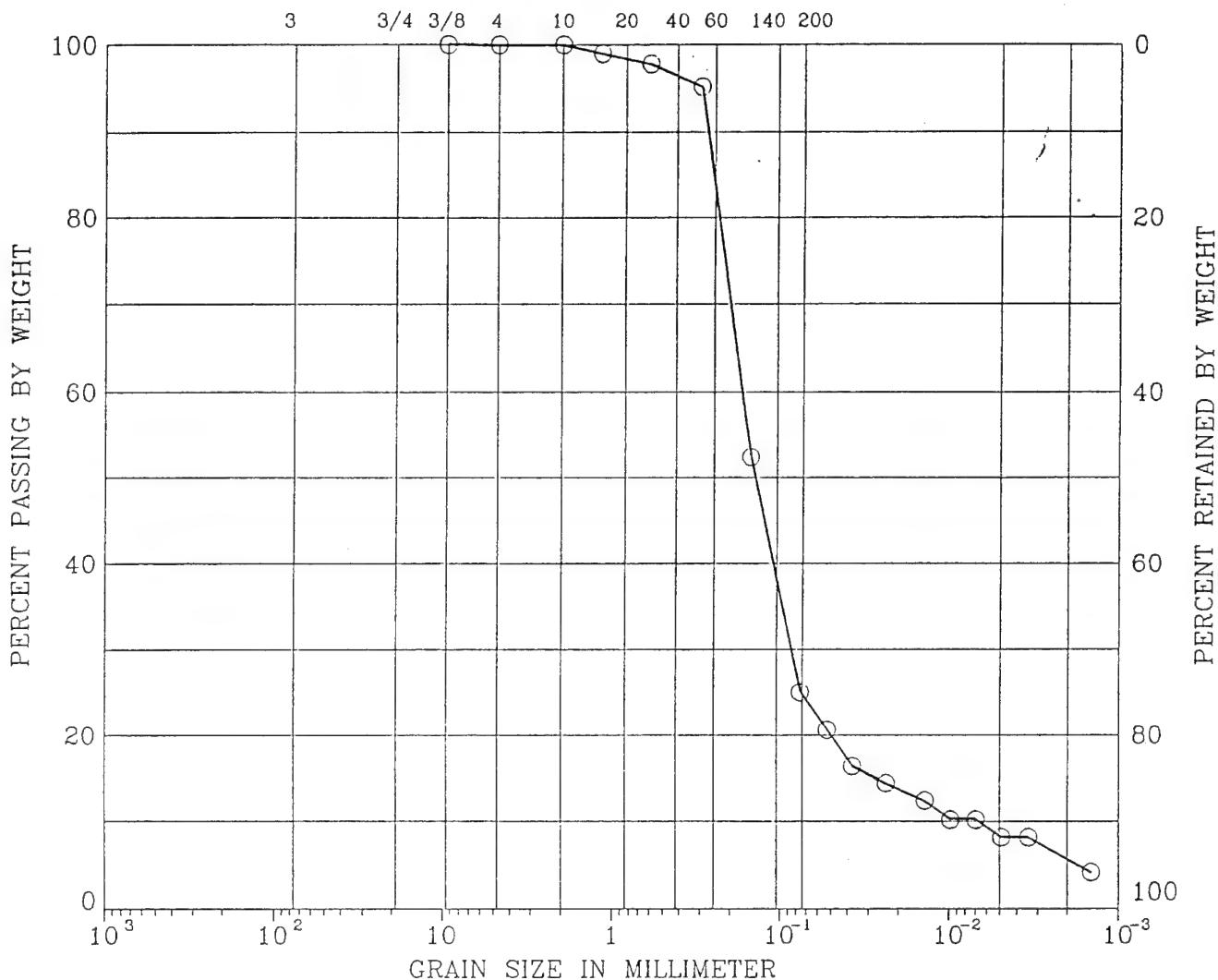
\*This is second attempt Shelby Tube Sample

CHP/jh  
[3442400.sce]



# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



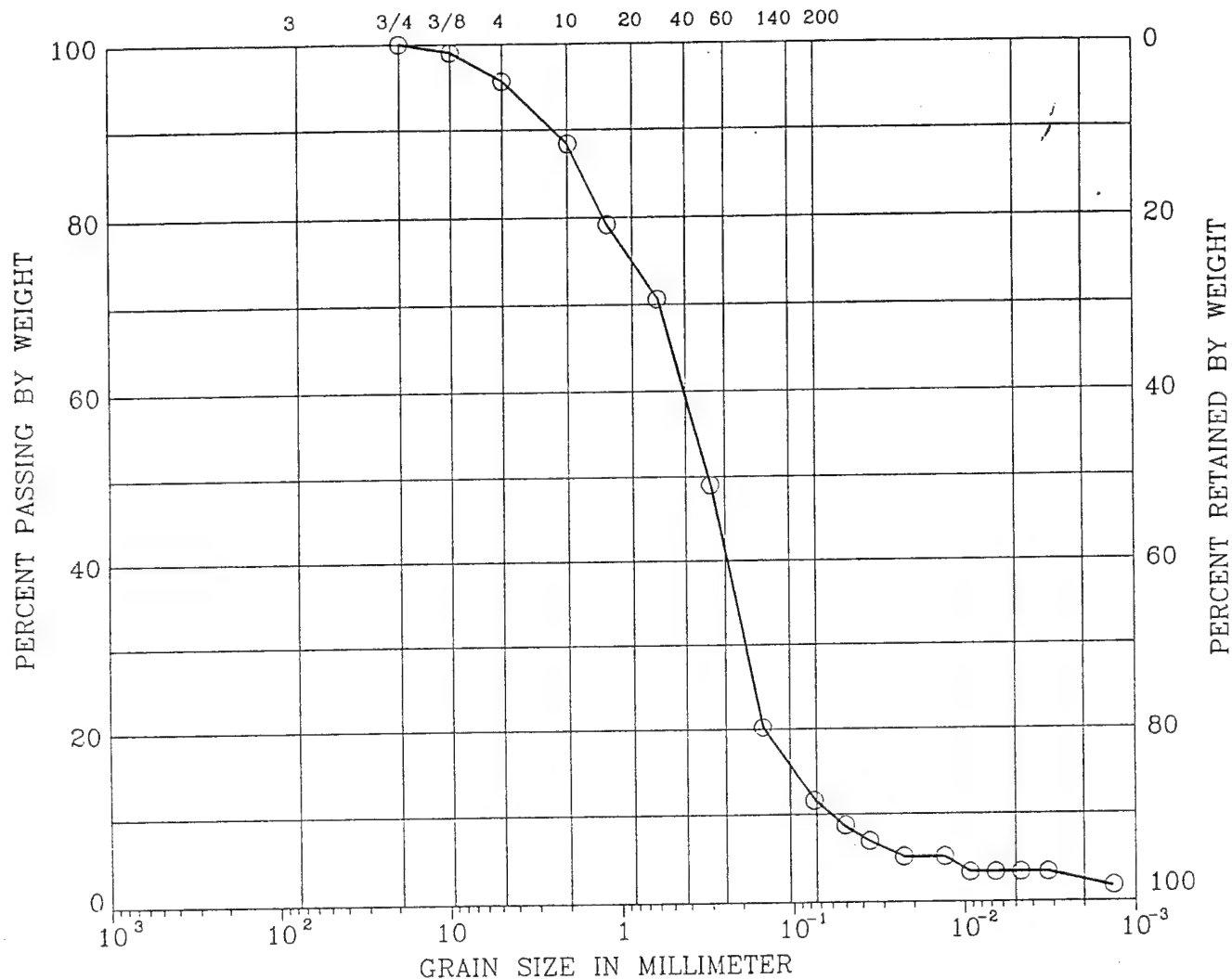
SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P1MW10T5	14.-16.	16	7	SAND, silty, clayey, brown	USC=SM-SC

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	POSMW7T3	18.-20.	12	6	SAND, clayey, light brown w/rock fragments USC=SW

Remark : Earth Technology Corporation

Project No.3-4424

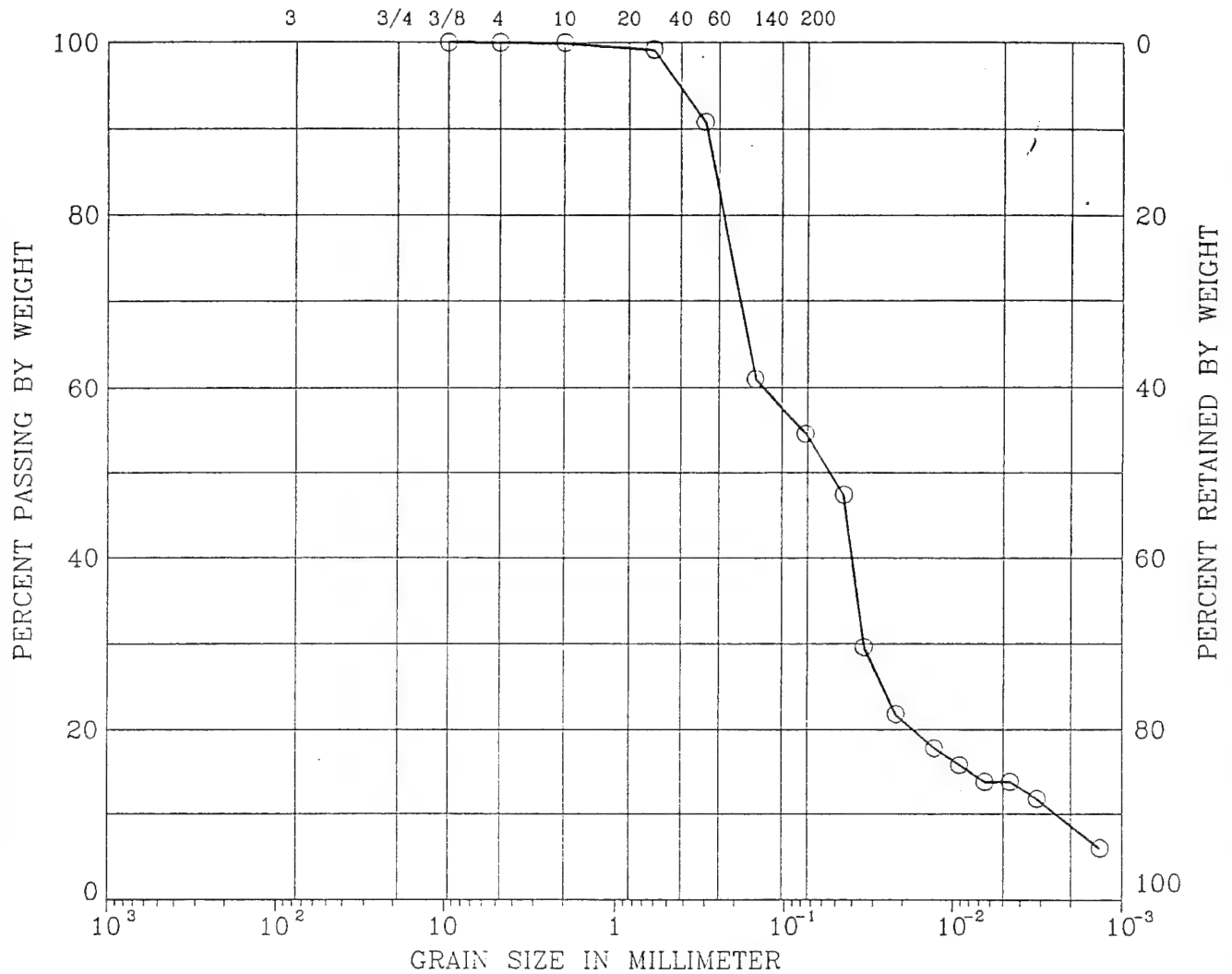
Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY,
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P3B13/T1	53.-55.	21	11	CLAY, silty, brown	USC=CL

Remark : Earth Technology Corporation

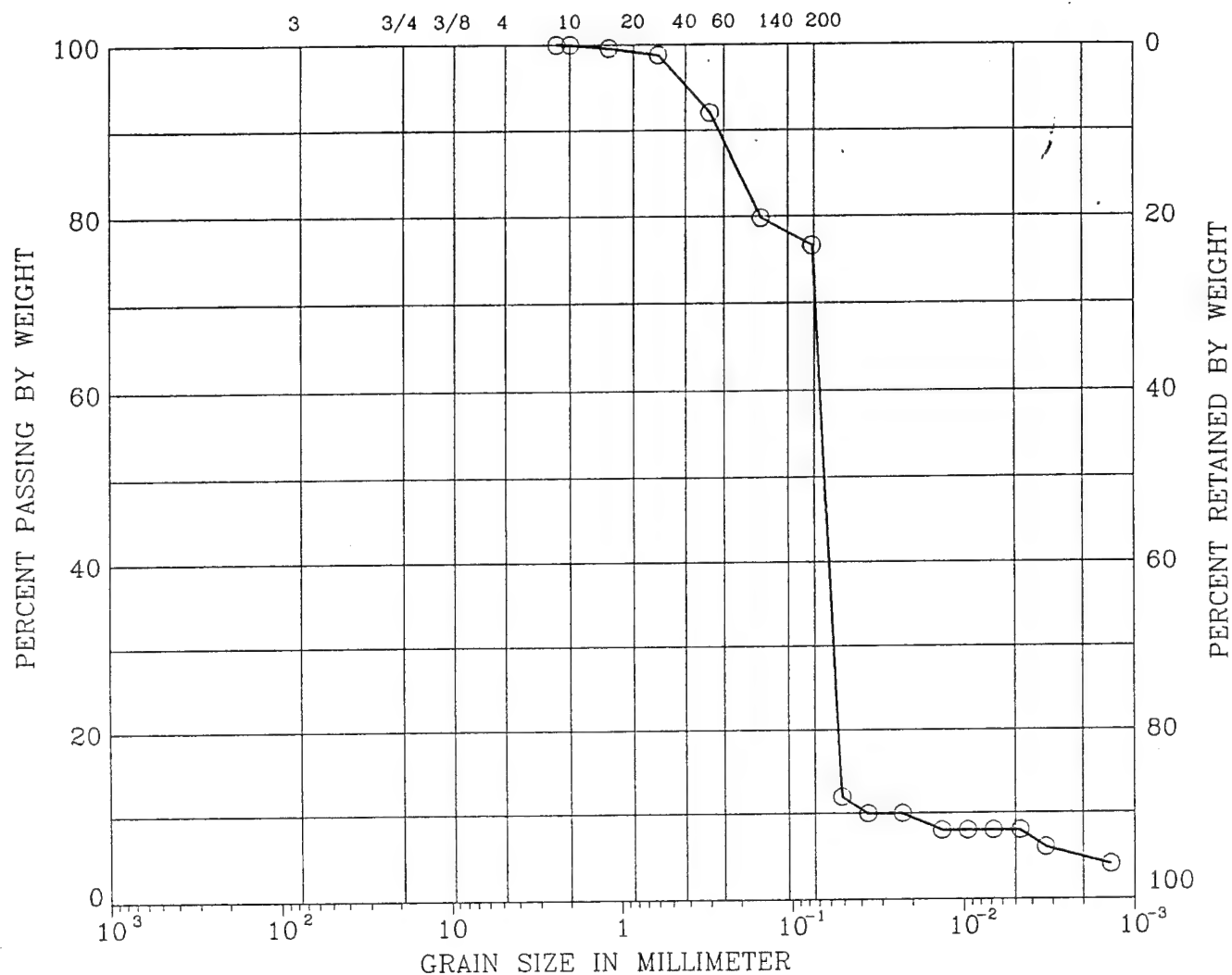
Project No.3-4424

Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



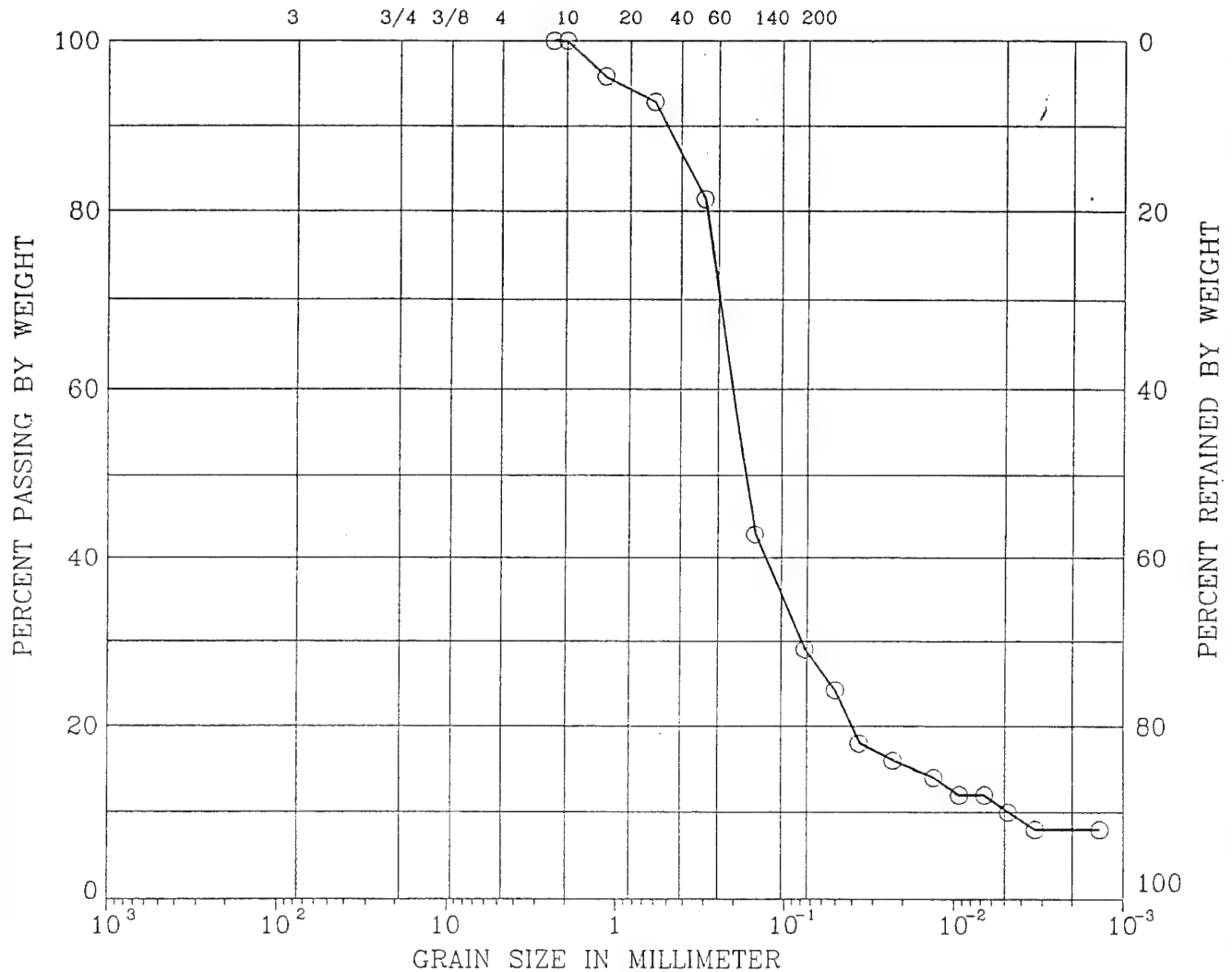
<u>SYMBOL</u>	<u>BORING</u>	<u>DEPTH</u> <u>(ft)</u>	<u>LL</u> <u>(%)</u>	<u>PI</u> <u>(%)</u>	<u>DESCRIPTION</u>	
○	LF6MW7T6	17.-19.	12	6	SILT, clayey, brown	USC=ML-CL

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION      Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
○	P4B15/T4	42.-43.	14	4	SAND, clayey, silty, brown	USC=SM-SC

Remark : Earth Technology Corporation

Project No.3-4424

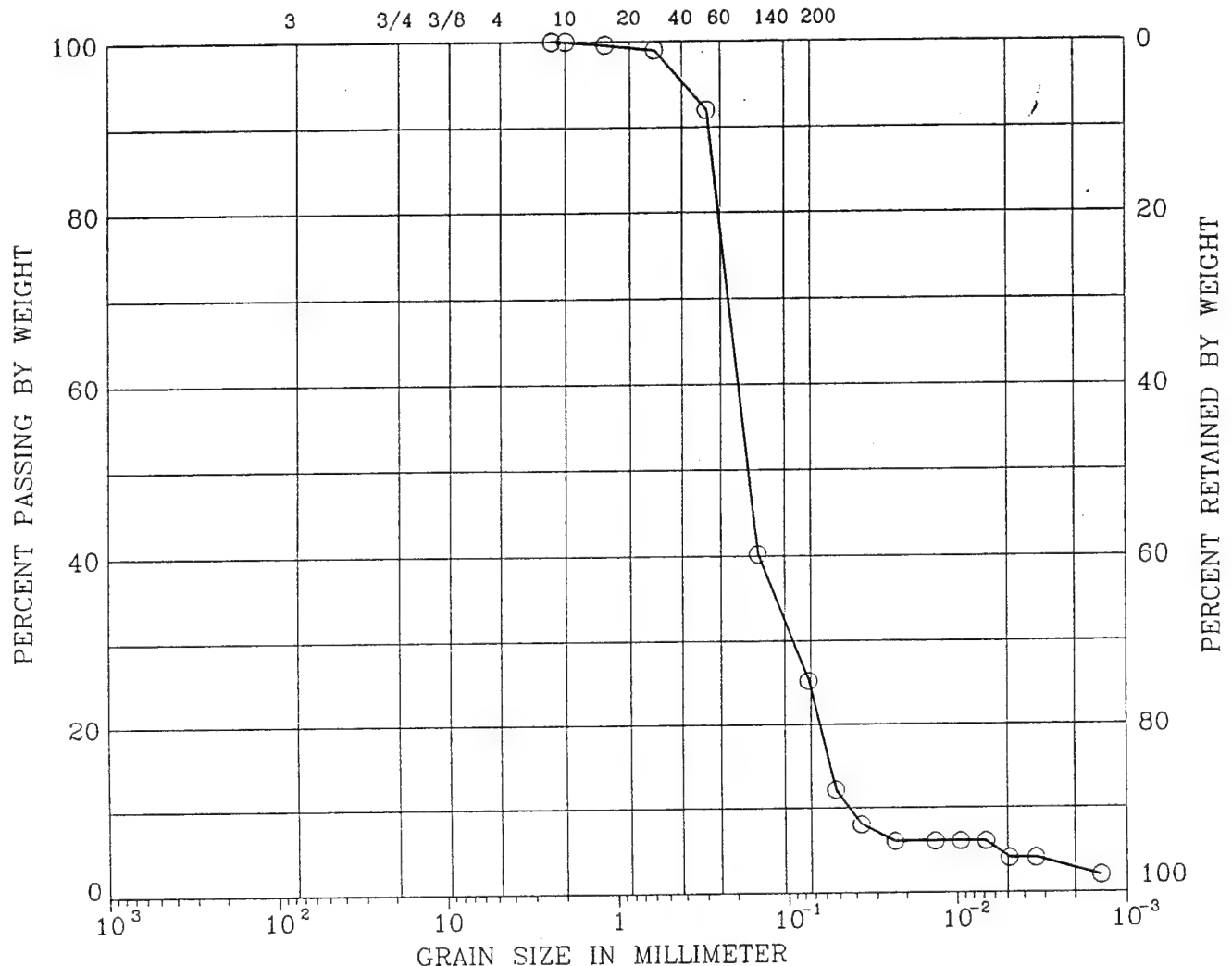
Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	P4B15/T4	42.-43.	16	4	SAND, slty, cly, br USC=SM-SC (2nd attempt sample)

Remark : Earth Technology Corporation

Project No.3-4424

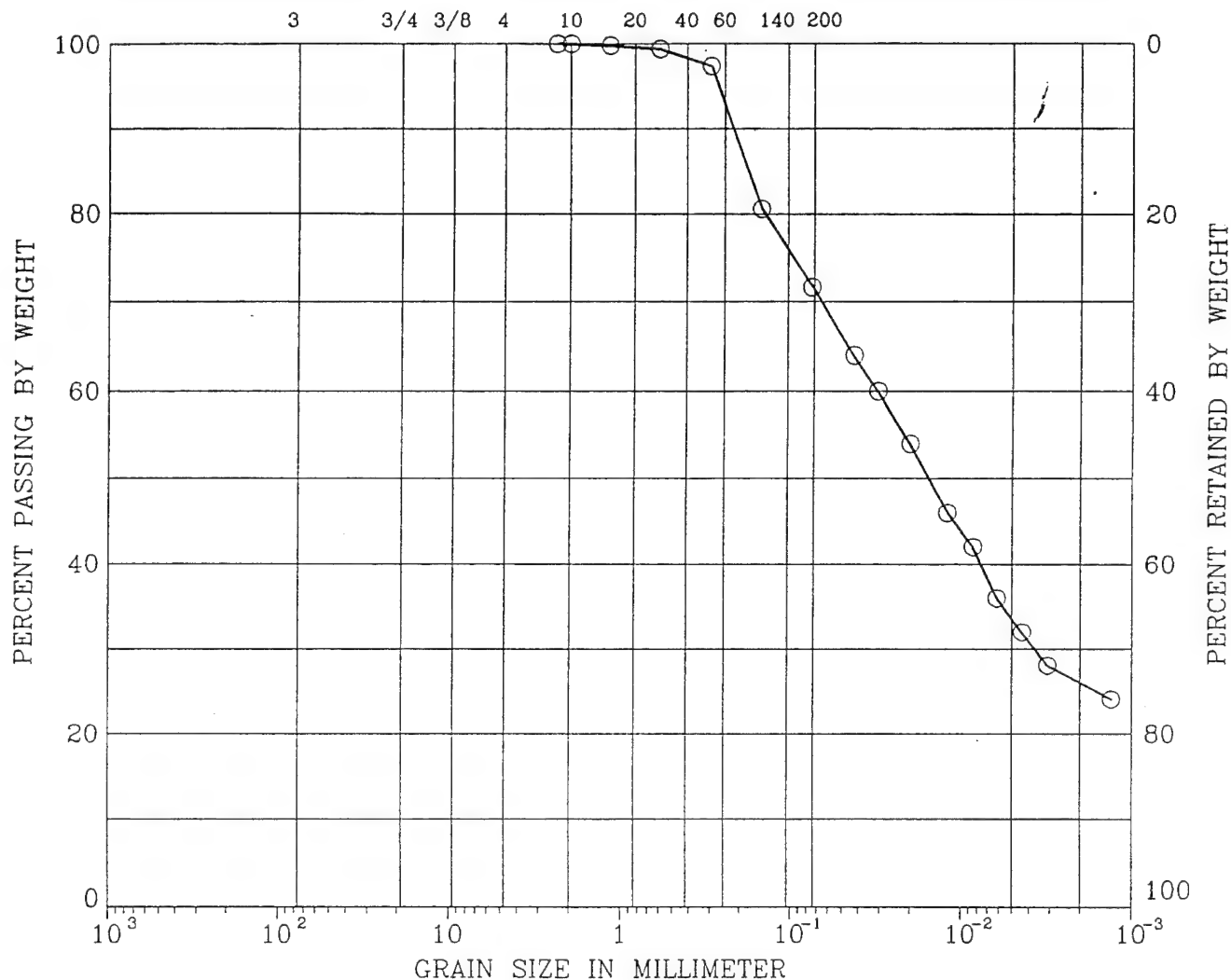
Earth Tech Lab Testing

G.A.  
TECHNICAL SERVICES

GRAIN SIZE DISTRIBUTION Sept. 23, 1993

# UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION	
O	POZB8/T2	55.-56.	30	16	CLAY, silty, slightly sandy, brown	USC=CL

Remark : Earth Technology Corporation

Project No.3-4424	Earth Tech Lab Testing
G.A. TECHNICAL SERVICES	GRAIN SIZE DISTRIBUTION Sept. 23, 1993

**Appendix D: Analytical Results; Initial Site Screening**



### Explanation

JP-4	Jet Petroleum No.4
1,1-DCE	1,1-Dichloroethene
t-1,2-DCE	trans-1,2-Dichloroethene
c-1,2-DCE	cis-1,2-Dichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
PCE	Tetrachloroethene
Total Xylenes	Summation of Meta-, Para-, and Ortho-Xylene

The term "trace" indicates the compound was detected below the reportable quantitation limit. Quantitation limits are presented below.

#### COMPOUND

#### QUANTITATION LIMITS

	<u>Soil-Gas</u>	<u>Water</u>
• 1,1-Dichloroethene (DCE)	0.5 ppb	0.5 ppb
• trans-1,2-DCE	0.5 ppb	0.5 ppb
• cis-1,2-DCE	0.5 ppb	1.0 ppb
• 1,1,1-Trichloroethane (TCA)	0.05 ppb	0.05 ppb
• Trichloroethene (TCE)	0.05 ppb	0.05 ppb
• Tetrachloroethene (PCE)	0.05 ppb	0.05 ppb
• Benzene	50 ppb	5.0 ppb
• Toluene	50 ppb	5.0 ppb
• Ethylbenzene	50 ppb	5.0 ppb
• Total Xylenes	50 ppb	5.0 ppb
• Total Volatiles as JP4	20 ppm	22 ppb

**Table 1. Sample Results (JP-4)**

Sample results from November 1992 survey

Sample I.D.	Depth, ft.	JP-4 (ppm)
1SG-1	3	< 10
1SG-2	6	69
1SG-3	5	32
1SG-4	3	26
1SG-5	5	12000
1SG-6	5	18
1SG-7	5	62000
1SG-8	5	43
1SG-9	3	55000
1SG-10	3	14
1SG-11	5	130
1SG-12	5	43
1SG-13	5	45
1SG-14	3	< 10
1SG-15	5	12000
1SG-16	5	36
1SG-17	3	19
1SG-18	3	28
1SG-18 Dup.	3	14
1SG-19	5	< 10
1SG-20	3	10
1SG-21	5	12
1SG-22	5	< 10
1SG-23	5	53
1SG-23 Dup.	5	38
1SG-24	4	230
1SG-25	5	180
1SG-26	3	59
1SG-27	3	38
1SG-28	6	53
1SG-29	6	12000
1SG-30	3	100
1SG-31	9	67
1SG-32	6	< 10
1SG-33	6	< 10
1SG-34	3	9100
1SG-35	6	13000
1SG-36	6	7100
1SG-36 Dup.	6	3200
1SG-37	6	1700
16SG-1	3	17

**Table 1. Sample Results, Con'd.**

Sample results from November 1992 survey

Sample I.D.	Depth, ft.	JP-4 (ppm)
16SG-1	6	19
16SG-1	9	< 10
16SG-2	9	11
16SG-3	9	< 10
16SG-4	9	< 10
16SG-5	6	< 10
16SG-6	6	13
16SG-7	6	< 10
16SG-8	6	< 10
16SG-9	6	10
16SG-10	6	< 10
16SG-11	6	< 10
16SG-12	6	< 10
9SG-13	9	< 10
9SG-14	9	< 10
9SG-20	9	< 10
9SG-21	9	< 10
9SG-25	9	< 10

Results are in ppb

D-4

Table 1. JP-4 Data

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppm
<b>Soil Gas</b>		
8SG-1	3	32
8SG-1	6	< 20
8SG-1	9	24
8SG-2	3	21
8SG-3	6	< 20
8SG-4	9	< 20
8SG-5	9	< 20
8SG-6	3	< 20
8SG-6	6	< 20
8SG-6	9	< 20
8SG-7	6	< 20
8SG-8	6	< 20
8SG-9	6	30
8SG-10	6	< 20
8SG-11	6	< 20
8SG-12	6	24
8SG-13	6	< 20
8SG-14	6	< 20
8SG-15	6	< 20
8SG-16	6	< 20
8SG-17	6	< 20
8SG-17	12	< 20
8SG-18	6	< 20
8SG-19	6	< 20
* 1SG-1	6	19000
** 1SG-2	6	84000
2SG-1	6	< 20
2SG-2	6	< 20
2SG-3	6	25
2SG-4	6	< 20
2SG-5	6	24
2SG-5Dup.	6	21
2SG-6	6	20
2SG-7	6	< 20
2SG-8	3	< 20
2SG-8	5	< 20
2SG-9	5	< 20
2SG-10	5	< 20
2SG-11	5	< 20
2SG-12	5	< 20
2SG-13	5	22

\* taken in the area of 1SG-29 (November 1992) as a QC check

\*\* taken in the area of 1SG-36 (November 1992) as a QC check

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppm
2SG-14	5	47
2SG-15	5	< 20
2SG-16	5	< 20
2SG-17	5	24
2SG-18	5	< 20
2SG-19	5	< 20
2SG-20	5	26
2SG-21	5	< 20
2SG-22	5	< 20
2SG-23	5	< 20
2SG-24	2.5	< 20
2SG-24	5.5	< 20
2SG-25	5	< 20
2SG-26	5	< 20
2SG-27	5	< 20
2SG-28	5	< 20

Water μg/L (ppb)

1GW-1	6-9	< 22
1GW-2	6-9	69
1GW-3	6-9	< 22
1GW-4	6-9	< 22
1GW-5	6-9	64
1GW-6	6-9	< 22
1GW-7	6-9	< 22
1GW-8	6-9	< 22
1GW-9	6-9	23
2GW-1	7-10	69
2GW-2	8-11	24
2GW-3	8-11	22
2GW-4	9-12	< 22
2GW-4 Dup.	9-12	< 22
2GW-5	9-12	< 22
2GW-6	9-12	22
2GW-6	18-21	22
2GW-6 Dup.	18-21	22
2GW-7	8-11	22
2GW-8	8-11	< 22
2GW-9	8-11	< 22
2GW-10	8-11	< 22
2GW-11	8-11	22
2GW-12	8-11	< 22

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppb
2GW-12 Dup.	8-11	< 22
5GW-1	6-9	< 22
5GW-2	-- 6-9	< 22
5GW-3	5-8	< 22
5GW-4	5-8	< 22
5GW-5	8-11	39
5GW-6	8-11	< 22
5GW-7	8-11	< 22
5GW-8	8-11	< 22
5GW-9	8-11	22
5GW-10	9-12	< 22
5GW-11	8-11	< 22
5GW-12	6-9	< 22
5GW-12 Dup.	6-9	< 22
5GW-13	6-9	< 22
5GW-14	6-9	< 22
5GW-15	6-9	22
5GW-16	6-9	25000
6GW-1	112-15	4400
6GW-2	15-18	22
6GW-2 Dup.	15-18	< 22
6GW-3	15-18	25
6GW-4	15-18	110
6GW-5	17-20	27
6GW-6	11-14	65
6GW-6 Dup.	11-14	110
6GW-7	8-11	< 22
6GW-8	14-17	< 22
6GW-8 Dup.	14-17	< 22
8GW-1	11-14	< 22
8GW-1	20-23	22
8GW-2	14-17	< 22
8GW-3	14-17	< 22
8GW-3	26-29	< 22
8GW-4	14-17	< 22
8GW-5	17-20	< 22
8GW-6	14-17	< 22
8GW-6 Dup.	14-17	< 22
8GW-7	14-17	< 22
8GW-8	18-21	< 22
8GW-9	17-20	< 22
8GW-9	26-29	23

Table 1. JP-4 Data (Con't)

Sample results from January 1993 survey

Sample I.D.	Depth, ft.	JP-4, ppb
9GW-1	18-21	< 22
9GW-1 Dup.	18-21	< 22
9GW-2	18-21	< 22
9GW-3	18-21	< 22
9GW-3 Dup.	18-21	< 22
9GW-4	18-21	< 22
9GW-5	15-21	< 22
9GW-6	18-21	23
9GW-6 Dup.	18-21	22
9GW-7	15-21	< 22
9GW-8	21-24	< 22
9GW-9	18-21	< 22
9GW-10	18-21	< 22
9GW-11	18-21	< 22
9GW-12	18-21	< 22
9GW-13	21-24	57
9GW-14	18-21	< 22
9GW-14 Dup.	18-21	< 22
9GW-15	21-24	< 22

13



Table 2. Target VOC Data  
Sample result from January 1993 survey

Sample No.	Results are in ppb							Toluene	Ethylbenzene	Total Xylenes
	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene			
8SG-1-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-1-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-2-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-3-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-4-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-5-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-6-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-6-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-6-9'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-7-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-8-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-9-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-10-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-11-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-12-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-13-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-14-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-15-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-16-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-17-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-17-12'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
8SG-18-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
1SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	75000	8800	24000	5200
1SG-2-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	11000	7100	9500	1100
2SG-1-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-2-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-3-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-4-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-5-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-2 Dup-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-6-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-7-6'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-8-3'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey  
Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
2SG-8-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-9-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-10-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-11-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-12-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-13-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-14-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-15-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-16-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-17-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-18-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-19-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-20-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-21-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-22-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-23-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-24-2.5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-24-5.5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-25-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-26-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-27-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
2SG-28-5'	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.21	< 50	< 50	< 50	< 50
Water										
1GW-1-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-2-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-3-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-4-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-5-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-6-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-7-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-8-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
1GW-9-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-1-7-10'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)

Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
2GW-2-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-3-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-4-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-4 Dup.-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-5-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-6 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-8-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.15	< 5.0	< 5.0	< 5.0	< 5.0
2GW-9-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-10-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-11-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-12-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-12 Dup.-8-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-1-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-2-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-3-5-8'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-4-5-8'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-5-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-6-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-8-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-9-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-10-9-12'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-11-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-12-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-12 Dup.-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-13-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-14-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-15-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
5GW-16-6-9'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-1-12-15'	< 0.5	< 0.5	< 1.0	< 0.05	0.02	0.15	1400	480	370	280
6GW-2-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	1.30	< 0.05	270	120	110	27
	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
6GW-2 Dup.-15-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-3-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-4-15-18'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-5-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-6-11-14'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-6 Dup.-11-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-7-8-11'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-8-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
6GW-8 Dup.-14-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-1-11-14'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-1-20-23'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-2-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3-26-29'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-4-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.07	< 5.0	< 5.0	< 5.0	< 5.0
8GW-5-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6 Dup.-14-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-7-14-17'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-8-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-9-17-20'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-9-26-29'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-1-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-1 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-2-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-4-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-5-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-6-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-6 Dup.-18-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-7-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-8-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-9-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.08	< 5.0	< 5.0	< 5.0	< 5.0

Table 2. Target VOC Data (Con't.)  
Sample result from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-10-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-11-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	0.07	< 5.0	< 5.0	< 5.0	< 5.0
9GW-12-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-13-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-14-18-21'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-14 Dup.-18-	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-15-21-24'	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

**Table 3. Laboratory Duplicates**  
Sample results from November 1992 survey

Sample I.D.		JP-4, ppm	
1SG-17		19	
Lab Duplicate		13	
RPD		38%	
1SG-22		< 10	
Lab Duplicate		< 10	
RPD		0	
16SG-4		< 10	
Lab Duplicate		< 10	
RPD		0	
1SG-36		7100	
Lab Duplicate		7300	
RPD		3%	

Sample I.D.		Results are in ppb									
1,1-DCE		t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes	
9SG-7		< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200	
Lab Duplicate		< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200	
RPD		0	0	0	0	0	0	0	0	0	
9SG-26		< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200	
Lab Duplicate		< 0.50	< 0.50	< 0.050	< 0.050	< 0.030	< 50	< 50	< 200	< 200	
RPD		0	0	0	0	0	0	0	0	0	

Table 3. QA/QC Data  
Sample results from January 1993 survey

		Results are in ppb									
Soil-Gas Lab Duplicates		1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
Sample No.											
2SG-27-5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
2SG-28-5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.20	< 50	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	0.20	< 50	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
8SG-19	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
8SG-1-3'	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
2SG-2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
2SG-22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 50	< 50	< 50	< 50
RPD	0	0	0	0	0	0	0	0	0	0	0
Water Lab Duplicates											
5GW-9	< 0.5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
Lab Duplicate	< 0.5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
RPD	0	0	0	0	0	0	0	0	0	0	0

Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Sample No.	Results are in ppb										Ethylbenzene	Toluene	Benzene	PCE	TCE	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	1,1-DCE
	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes									
1GW-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
1GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
1GW-8	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
2GW-6	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
9GW-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									
9GW-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0									
RPD	0	0	0	0	0	0	0	0	0	0									



Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
Lab Duplicate	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
RPD	0	0	0	0	0	0	0	0	0	0
<b>Water Matrix Spikes</b>										
2GW-7	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-7 spike	1.8	2.3	2.7	0.11	0.22	0.14	6.8	6.2	4.7	5.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	96	123	144	58	116	74	71	65	49	57
8GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-3 Spike	2.1	2.7	3.0	0.13	0.25	0.17	8.0	7.3	5.2	6.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	111	142	158	68	132	89	84	77	55	67
8GW-6	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
8GW-6 Spike	1.8	2.3	2.8	0.10	0.22	0.12	7.0	6.3	4.6	5.6
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	95	121	147	53	116	63	74	66	48	59
2GW-5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
2GW-5 Spike	1.8	2.3	2.8	0.10	0.22	0.13	6.8	6.2	4.6	5.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	95	121	147	53	116	68	71	65	48	57
9GW-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-3 Spike	1.3	1.7	2.4	0.09	0.25	0.11	7.3	6.4	4.2	5.0
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	68	89	126	47	132	58	77	67	44	53

Table 3. QA/QC Data (Con't.)

Sample results from January 1993 survey

Results are in ppb

Sample No.	1,1-DCE	t-1,2-DCE	c-1,2-DCE	1,1,1-TCA	TCE	PCE	Benzene	Toluene	Ethylbenzene	Total Xylenes
9GW-11	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-11 Spike	1.2	1.3	2.0	0.07	0.22	0.14	6.0	5.3	4.0	4.4
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	63	68	105	37	116	74	63	56	42	46
9GW-12	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
9GW-12 Spike	1.2	1.5	2.2	0.08	0.23	0.11	6.8	5.8	4.1	4.7
Amount Added	1.9	1.9	1.9	0.19	0.19	0.19	9.5	9.5	9.5	9.5
% Recovery	63	79	116	42	121	58	71	61	43	49
Equipment Rinseate Blanks										
EB-1	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-2	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-3	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-4	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0
EB-5	< 0.5	< 0.5	< 1.0	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0	< 5.0	< 5.0

## Laboratory Blanks

All instrument, syringe, vial and syringe blanks were below reporting limits.

## **Appendix E: Analytical Results; Onsite Screening**



### Explanation

t-1,2-DCE	trans-1,2-Dichloroethene
c-1,2-DCE	cis-1,2-Dichloroethene
TCE	Trichloroethene
PCE	Tetrachloroethene
EB	Ethylbenzene
M/P-Xylene	Summation of Meta- and Para-Xylene
O-Xylene	Ortho-Xylene

Samples in this Appendix are to be denoted as follows;

Suffix-Sample ID ending	Meaning
A,B,C, ect.	indicate a soil sample
AW,BW,CW, etc. and H1,H2,H3, etc.	indicate groundwater samples collected utilizing a Hydro-punch
AA,BB,CC, etc.	indicate groundwater samples collected after development and purge utilizing a bailer.
AHA,AHB,AHC, etc.	indicate a sediment sample collected utilizing a hand auger

Note: QA and ER samples correspond to sampling activities on that date and are site specific.

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1B12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P1B13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P1B13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/26/93
P1B4A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5A LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B5B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1B9A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/25/93
P1B9B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1MW10A	BM	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/29/93
P1MW10AA LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	09/09/93
P1MW10AA LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	09/09/93
P1MW10AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/29/93
P1MW10B	2	ND	304	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/29/93
P1MW10BB	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	08/29/93
P1MW10BB FIELD DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	08/29/93
P1MW10BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	WATER	08/30/93
P1MW10C	BM	ND	472	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/29/93
P1MW10C FIELD DUP	2	ND	518	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/29/93
P1MW10D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/29/93
P1MW11A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/30/93
P1MW11AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	WATER	08/30/93
P1MW11B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/30/93
P1MW11BB	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	WATER	09/08/93
P1MW11C	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/30/93
P1MW11D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/30/93
P1MW12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/08/93
P1MW12B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	09/08/93

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1MW12C	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	09/08/93
P1MW12D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/08/93
P1MW12D LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/08/93
P1MW12E	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/08/93
P1MW13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	09/09/93
P1MW13AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	09/08/93
P1MW13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	09/09/93
P1MW13C	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	09/09/93
P1MW13D	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/09/93
P1MW13D LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/09/93
P1MW13ER1	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/09/93
P1MW13ERZ	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/09/93
P1MW14AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW14AW FIELDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW14AW LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	WATER	09/11/93
P1MW1AW	17	2	44	77	4	28	103	348	ND	7	WATER	08/24/93
P1MW1BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1BW FIELDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1BW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	WATER	08/24/93
P1MW1CW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	31	WATER	08/24/93
P1MW1ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/24/93
P1MW2A	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	SOIL	09/08/93
P1MW2AA	2	ND	ND	BMDL	6	ND	ND	ND	ND	4	WATER	08/30/93
P1MW2AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/26/93
P1MW2AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	09/08/93
P1MW3AW	ND	ND	ND	16	56	ND	ND	ND	ND	7	WATER	08/26/93
P1MW4AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/30/93
P1MW4AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/27/93
P1MW4AW LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/27/93
P1MW5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW5AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW5AW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93

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SAMPLE ID	t-1,2-DCE c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P1MW6A LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW6AA	ND	31	54	46	20	199	437	ND	4	WATER	08/30/93
P1MW6AW	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW6B	ND	14	882	144	ND	1776	4436	ND	9-11	SOIL	08/29/93
P1MW7A	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/28/93
P1MW7AW	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW8A	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/29/93
P1MW8A	ND	20	328	ND	ND	372	1160	ND	1-3	SOIL	08/30/93
P1MW8AW	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/28/93
P1MW8C	10	ND	774	ND	ND	ND	ND	ND	9-11	SOIL	08/30/93
P1MW8D	ND	ND	798	ND	ND	ND	ND	ND	12	SOIL	08/30/93
P1MW8D LABDUP	ND	ND	812	ND	ND	ND	ND	ND	12	SOIL	08/30/93
P1MW9A	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/29/93
P1MW9AA	2	10	4	12	8	BMDL	14	8	5	WATER	08/29/93
P1MW9AW	ND	3	BMDL	ND	6	ND	ND	ND	6	WATER	08/28/93
P1PZ3	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/24/93
P1SB4B	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/25/93
P1TW15A	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/12/93
P1TW15AW	2	ND	ND	1	BMDL	ND	4	ND	9	WATER	09/12/93
S1MW11A FIELD DUP.	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/31/93
S1MW11A LAB DUP	ND	ND	166	ND	ND	ND	ND	ND	3	SOIL	08/31/93
S1MW11AA	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/31/93
P2MW6A	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/16/93
P2MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	8	WATER	08/24/93
P2MW6BB	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	09/09/93
P2MW6C	ND	ND	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/16/93
P2MW6C	ND	ND	1	ND	ND	ND	ND	ND	14-16	SOIL	08/17/93
P2MW6D	ND	ND	ND	ND	ND	ND	ND	ND	18	SOIL	08/17/93
P2MW6H1	ND	ND	BMDL	BMDL	ND	ND	ND	ND	12	WATER	08/16/93
P2MW6H2	BM	3	BMDL	ND	ND	ND	ND	ND	27	WATER	08/16/93
P2MW6H3	ND	ND	ND	ND	ND	ND	ND	ND	42	WATER	08/16/93
P2MW7A	ND	ND	ND	ND	BMDL	ND	ND	ND	0-2	SOIL	08/18/93



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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P2MW7A LAB DUP	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	0-2	SOIL	08/18/93
P2MW7AA	ND	ND	1	ND	ND	9	ND	ND	ND	7	WATER	08/24/93
P2MW7B	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/18/93
P2SB2A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/14/93
P2SB2B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB2C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P2SB2D	ND	ND	ND	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/14/93
P2SB3A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/14/93
P2SB3B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB3C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P2SB3D	ND	ND	ND	ND	ND	ND	ND	ND	ND	6-8	SOIL	08/14/93
P2SB4A	ND	ND	ND	ND	ND	4	ND	ND	ND	0-2	SOIL	08/14/93
P2SB4B	ND	ND	ND	ND	ND	3	ND	ND	ND	0-2	SOIL	08/14/93
P2SB4C	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/14/93
P2SB4D	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/14/93
P2SB5A	ND	ND	ND	ND	ND	1	ND	ND	ND	6-8	SOIL	08/14/93
P2SB5B	ND	ND	ND	ND	ND	13	ND	ND	ND	0-2	SOIL	08/14/93
P2SB5C	ND	ND	ND	ND	ND	2	ND	ND	ND	2-4	SOIL	08/14/93
P2SB5D	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	4-6	SOIL	08/14/93
P2SB6A	ND	ND	ND	ND	ND	2	ND	ND	ND	6-8	SOIL	08/14/93
P2SB6B	ND	ND	ND	ND	ND	BMDL	ND	ND	ND	2-4	SOIL	08/15/93
P2SB7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
P2SB7C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB8B	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
P2SB8C	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P2SB9A	ND	ND	ND	ND	ND	1	ND	ND	ND	54-56	SOIL	08/16/93
P2SB9B	ND	ND	ND	ND	ND	1	ND	ND	ND	0-2	SOIL	08/17/93
P2SB9C	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/17/93
P2SB9D	ND	ND	ND	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/17/93
P3MW6AA	ND	ND	ND	ND	ND	ND	ND	3	ND	14	WATER	08/30/93

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P3MW6AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	17	WATER	08/25/93
P3MW6BW	2	16	2	3	BMDL	ND	ND	ND	ND	27	WATER	08/26/93
P3MW6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/25/93
P3MW6C LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/25/93
P3MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3-5	SOIL	08/31/93
P3MW7AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19	WATER	08/30/93
P3MW7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/31/93
P3MW7BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	29	WATER	08/30/93
P3MW7C	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/31/93
P3MW7CW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	39	WATER	08/30/93
P3P21A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/25/93
P3P21AA	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	3	WATER	08/30/93
P3P21B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/25/93
P3P21B LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	SOIL	08/25/93
P3P21C	ND	ND	ND	ND	ND	ND	ND	34	116	18	SOIL	08/25/93
P3P22AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	WATER	08/29/93
P3P26A	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	SOIL	08/25/93
P3SB11A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB11A LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB11B	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB11C	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB12A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P3SB12B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB12C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB12D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB12D LABDUP.	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB13A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/26/93
P3SB13B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/26/93
P3SB13C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/26/93
P3SB13D	ND	ND	ND	ND	ND	ND	ND	ND	ND	10-12	SOIL	08/26/93
P3SB13HP1	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	17	WATER	08/26/93
P4B15A	ND	ND	BMDL	BMDL	ND	BMDL	ND	ND	ND	0-2	SOIL	08/11/93

11  
0

Analytical Results from On-Site Field GC  
Alpena CRTC, Alpena MI  
UNITS ppb

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P4B15B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/11/93
P4B15C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/11/93
P4B15D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/11/93
P4B15E	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19-21	SOIL	08/11/93
P4B15E DUP.	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19-21	SOIL	08/11/93
P05MW5AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/24/93
P05MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	WATER	08/24/93
P05MW7AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	08/24/93
P5MW5A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW5B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW5C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/12/93
P5MW6A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW6B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW6B LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW6D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	19.5	SOIL	08/12/93
P5MW6E	9	24	12	5	19	6	12	12	12	21	SOIL	08/12/93
P5MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW7A LAB DUP	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/12/93
P5MW7B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/12/93
P5MW7C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9	SOIL	08/12/93
P5MW7D	ND	ND	4	ND	ND	ND	ND	ND	ND	20	SOIL	08/12/93
P5MW7D DUP	ND	ND	3	ND	ND	ND	ND	ND	ND	20	SOIL	08/12/93
P5TW10AW	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	20	WATER	09/10/93
P5TW8AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	WATER	09/08/93
P5TW8AW	ND	8	30	BMDL	ND	ND	ND	ND	ND	19	WATER	08/31/93
P5TW8AW FIELDUP.	ND	8	34	ND	ND	ND	ND	ND	ND	19	WATER	08/31/93
P5TW8AW LABDUP.	ND	8	30	2	ND	ND	ND	ND	ND	9	SOIL	09/09/93
P5TW9AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	WATER	09/09/93
P5TW9BW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93
P5TW9CW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93
P5TW9CW	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	WATER	09/09/93

Analytical Results from On-Site Field GC

Alpena CRTC, Alpena MI

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
LF6AHA	ND	ND	BMDL	ND	BMDL	ND	ND	ND	ND	1	SOIL	09/11/93
LF6AHB	ND	ND	BMDL	ND	BMDL	ND	ND	ND	ND	1	SOIL	09/11/93
LF6AHC	ND	ND	ND	4	ND	ND	14	ND	ND	1	SOIL	09/11/93
LF6AHC LABDUP.	ND	ND	BMDL	4	ND	2	12	ND	ND	1	SOIL	09/11/93
LF6ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	09/11/93
P06MW4AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/24/93
P06MW5AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	WATER	08/24/93
P6MW4A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/11/93
P6MW4B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/11/93
P6MW4B SPIKE	67	82	91	100	166	112	160	159	143	QA	SOIL	08/11/93
P6MW4C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/11/93
P6MW4C SPIKE	59	77	78	87	146	96	140	140	124	QA	SOIL	08/11/93
P6MW5A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1	SOIL	08/11/93
P6MW5C	4	18	ND	18	38	64	82	44	34	10	SOIL	08/11/93
P6MW5C LAB DUP	5	21	ND	20	44	72	87	41	38	10	SOIL	08/11/93
P6MW5D	6	16	ND	22	40	49	98	44	51	10	SOIL	08/11/93
P6MW5E	ND	43	ND	64	78	122	478	160	875	8	SOIL	08/11/93
P6MW6A	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/14/93
P6MW6AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/11/93
P6MW6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/14/93
P6MW6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/14/93
P6MW6D	ND	ND	ND	ND	ND	ND	ND	ND	ND	38-40	SOIL	08/14/93
P6MW7A	ND	ND	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/16/93
P6MW7AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	WATER	08/24/93
P6MW7B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/16/93
P6MW7C	BM	ND	ND	BMDL	BMDL	ND	ND	ND	ND	14	SOIL	08/16/93
P6MW7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/16/93
P6MW8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	SOIL	08/27/93
P6MW8AA	BM	6	24	9	ND	4	23	22	ND	12	WATER	08/29/93
P6MW8AA LABDUP	1	7	24	9	ND	4	20	17	ND	12	WATER	08/29/93
P6MW8AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/27/93
P6MW8AW FIELD DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	WATER	08/27/93
P6MW8B	ND	ND	ND	ND	ND	ND	ND	ND	ND	7-9	SOIL	08/27/93

Analytical Results from On-Site Field GC  
Alpena CRTC, Alpena MI  
UNITS ppb

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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
P6MW8C	60	82	ND*	5724	408	3752	6318	3028	6958	9-11	SOIL	08/27/93
P6MW8D	ND	ND	ND	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/27/93
P6MW8E	2	12	8	12	ND	10	16	ND	ND	13-15	SOIL	08/27/93
P6MW8E LABDUP	2	14	8	14	ND	10	10	ND	ND	13-15	SOIL	08/27/93
P6MW9AA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	WATER	08/29/93
P6MW9AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/28/93
P6MW9AW LABDUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	WATER	08/28/93
P6TW10A	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	09/12/93
P6TW10AW	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	WATER	09/12/93
P6TW10B	ND	ND	ND	ND	ND	4	ND	ND	ND	7-9	SOIL	09/12/93
P8MW5A	ND	ND	ND	ND	ND	ND	ND	ND	ND	13-15	SOIL	09/12/93
P8SB2A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/13/93
P8SB2B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/13/93
P8SB2C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB2D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	11-13	SOIL	08/13/93
P8SB2E	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	56-58	SOIL	08/13/93
P8SB3A	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/13/93
P8SB3B	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/13/93
P8SB3C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB4A	ND	BM	ND	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/13/93
P8SB4B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/13/93
P8SB4C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/13/93
P8SB4D	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	0-2	SOIL	08/13/93
P8SB5C	ND	ND	BMDL	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/13/93
P8SB6B	ND	ND	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P8SB6C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/15/93
P8SB6D	ND	ND	ND	ND	ND	ND	ND	ND	ND	12-14	SOIL	08/15/93
P8SB7B	ND	BM	ND	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/15/93
P8SB7C	ND	ND	ND	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/15/93
P8SB7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	12-14	SOIL	08/15/93
P8SB8A	ND	ND	ND	ND	ND	ND	ND	ND	ND	1-3	SOIL	08/17/93
P8SB8B LAB DUP	ND	ND	ND	ND	ND	ND	ND	ND	ND	5-7	SOIL	08/17/93

MI  
CO

# Analytical Results from On-Site Field GC

Alpena CRTC, Alpena MI

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SAMPLE ID	t-1,2-DCE c-1,2-DCE Benzene	TCE	Toluene	PCE	EB	m/p-Xylene o-Xylene	Depth	Matrix	Date
P8SB8C	ND	ND	ND	ND	ND	ND	9-11	SOIL	08/17/93
P8SB8D	ND	ND	ND	ND	ND	ND	13-15	SOIL	08/17/93
P9MW4BB	ND	ND	ND	6	ND	ND	20	WATER	09/12/93
P9MW5BB	ND	ND	ND	ND	ND	ND	21	WATER	09/12/93
P9MW6A	ND	ND	ND	ND	ND	ND	3-5	SOIL	08/31/93
P9MW6B	ND	ND	ND	ND	ND	ND	8-10	SOIL	08/31/93
P9MW6C	ND	ND	ND	4	ND	ND	13-15	SOIL	08/31/93
P9SB13A	ND	ND	ND	ND	ND	ND	4-6	SOIL	08/29/93
P9SB13B	ND	ND	ND	ND	ND	ND	14-16	SOIL	08/29/93
P9SB13C	ND	ND	ND	ND	ND	ND	56-58	SOIL	08/29/93
P9TW7AW	ND	119	95	24	ND	881	21	WATER	09/10/93
P9TW7BW	4	2	BMDL	1	ND	19	31	WATER	09/10/93
P9TW7BW LABDUP.	4	2	BMDL	1	ND	18	31	WATER	09/10/93
P9TW8AW	3	ND	BMDL	ND	ND	ND	9	WATER	09/12/93
P9TW8AW LABDUP.	ND	2	BMDL	ND	ND	ND	9	WATER	09/12/93
RT9MW6AA	ND	536	3770	298	ND	10920	19	WATER	08/31/93
DECONH20	ND	BMDL	ND	ND	ND	ND	0	SOIL	08/11/93
PBG1A	ND	BMDL	ND	ND	ND	ND	0-2	SOIL	08/10/93
PBG1B	ND	BMDL	ND	ND	ND	ND	2-4	SOIL	08/10/93
PBG1C	ND	BMDL	ND	ND	ND	ND	4-6	SOIL	08/10/93
PBG1D	ND	BMDL	ND	ND	ND	ND	8-10	SOIL	08/10/93
PBG2A	ND	ND	ND	BMDL	ND	ND	0-2	SOIL	08/15/93
PBG2B	ND	ND	ND	ND	ND	ND	2-4	SOIL	08/15/93
PERA	ND	BMDL	ND	ND	ND	ND	QA	WATER	08/11/93
PERAA	ND	ND	ND	ND	ND	ND	QA	WATER	08/29/93
PERAB	ND	ND	ND	ND	ND	ND	QA	WATER	08/29/93
PERAC	ND	ND	ND	ND	ND	ND	QA	WATER	08/30/93
PERAD	ND	ND	ND	ND	ND	ND	QA	WATER	08/31/93
PERB	ND	ND	ND	ND	ND	ND	QA	WATER	08/16/93
PERB	ND	BMDL	ND	ND	ND	ND	QA	WATER	08/16/93
PERBB	ND	ND	ND	ND	ND	ND	QA	WATER	09/10/93

Analytical Results from On-Site Field GC  
 Alpena CRTC, Alpena MI  
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SAMPLE ID	t-1,2-DCE	c-1,2-DCE	Benzene	TCE	Toluene	PCE	EB	m/p-Xylene	o-Xylene	Depth	Matrix	Date
PERC	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/17/93
PERD	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/25/93
PERE	ND	ND	ND	ND	ND	ND	ND	ND	ND	QA	WATER	08/26/93





**Appendix F: Surface Water and Sediment  
Sampling Forms**



# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG

Project Number 931800-12

Location Sinkhole, Southwest of Site 4

Sample Number P04W001(E)

Site 4 - Surface drainage at Seep on South side

Duplicate Number       

Recorded By PH Lay

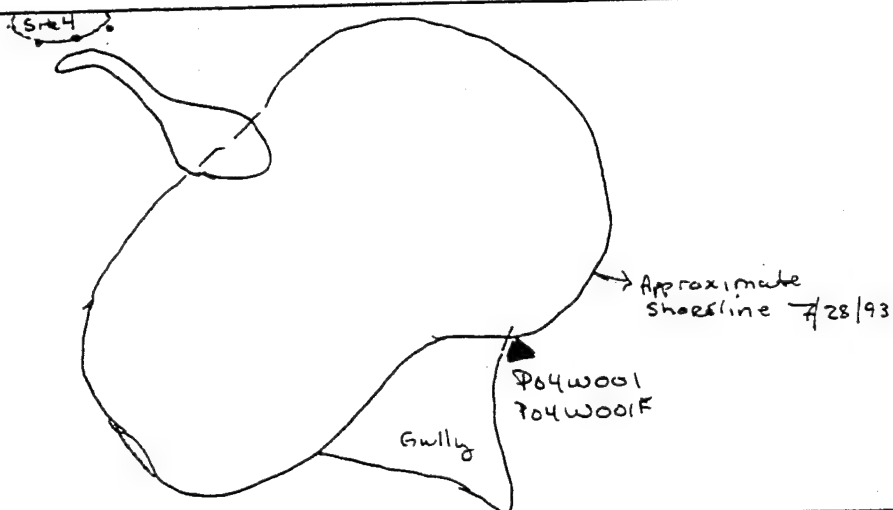
Date 7/28/93

Checked By       

Date       

Sampling Point Location (sketch)

← North



Not to scale

## Water Parameters

Before Sampling: pH        EC        Temperature       

After Sampling: pH 7.6 EC 298  $\mu$ ms Temperature 60.2°F

## Sampling Information


Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W001
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W001
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W001
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W001
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W001F

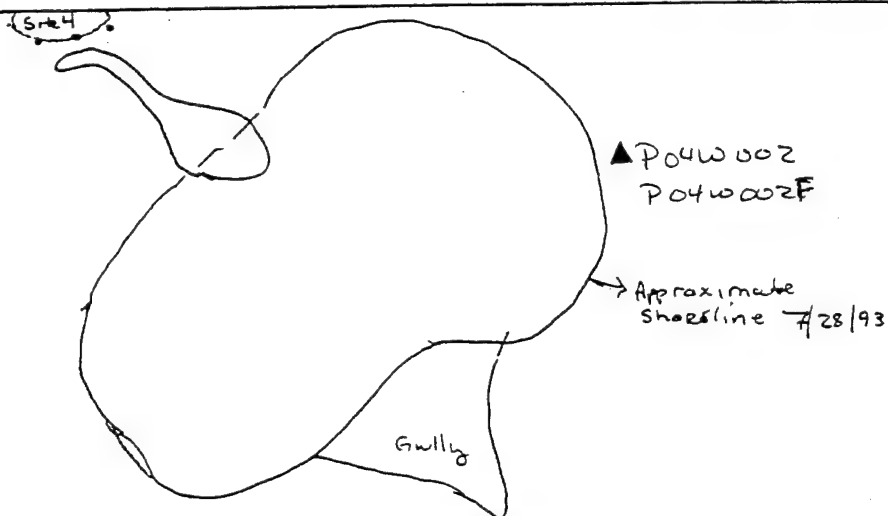
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage -  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W002 (F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

Sampling Point Location (sketch)

 North



not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.44 EC 273  $\mu$ S/cm Temperature 60.1°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCS	Surface		HCL, 4°C	4 x 40mL glass	P04W002
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W002
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W002
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W002
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W002

# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage - SE part of Sinkhole  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W003(F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

Sampling Point Location (sketch)

← North

Site 4

▲ P04W003  
P04W003F

→ Approximate  
Shoreline 7/28/93

Gully

\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.42 EC 285  $\mu$ S/cm Temperature 65.3°F

## Sampling Information


Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCl, 4°C	4 x 40mL glass	P04W003
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W003
TPH	Surface		HCl, 4°C	1 x 1 Liter glass	P04W003
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W003
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W003F

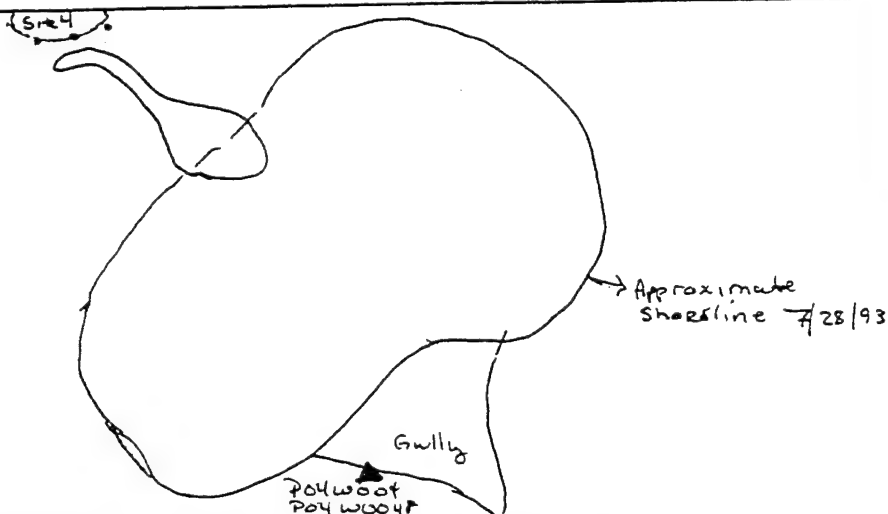
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage - seep SW of Site 4  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W004(F)  
 Duplicate Number \_\_\_\_\_  
 Date 7/28/93  
 Date \_\_\_\_\_

Sampling Point Location (sketch)

 North



not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.43 EC 303  $\mu$ S/cm Temperature 62.6 °F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCL, 4°C	4 x 40mL glass	P04W004
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W004
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W004
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W004
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W004F

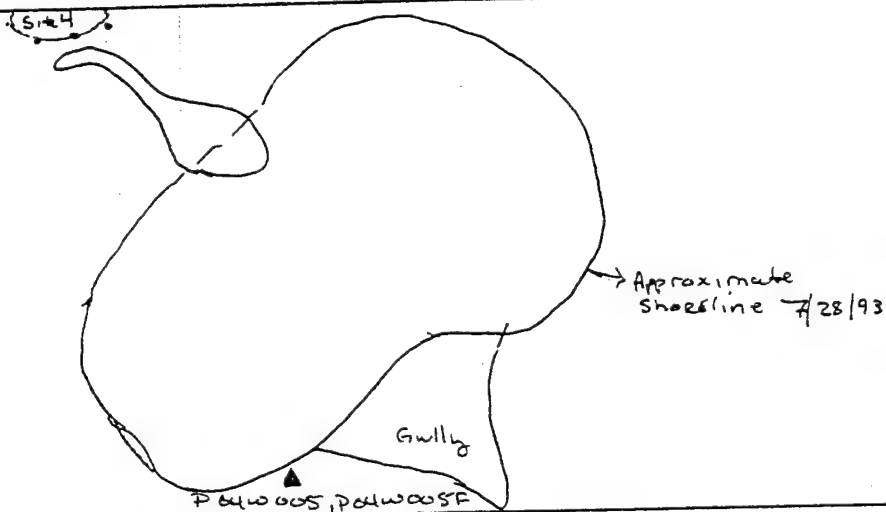
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W005 (F)  
 Duplicate Number —  
 Date 7/30/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North



## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 8.05 EC 291  $\mu$ S/cm Temperature 58°F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCl, 4°C	4 x 40mL glass	P04W005
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W005
TPH	Surface		HCl, 4°C	1 x 1 Liter glass	P04W005
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W005
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W005F

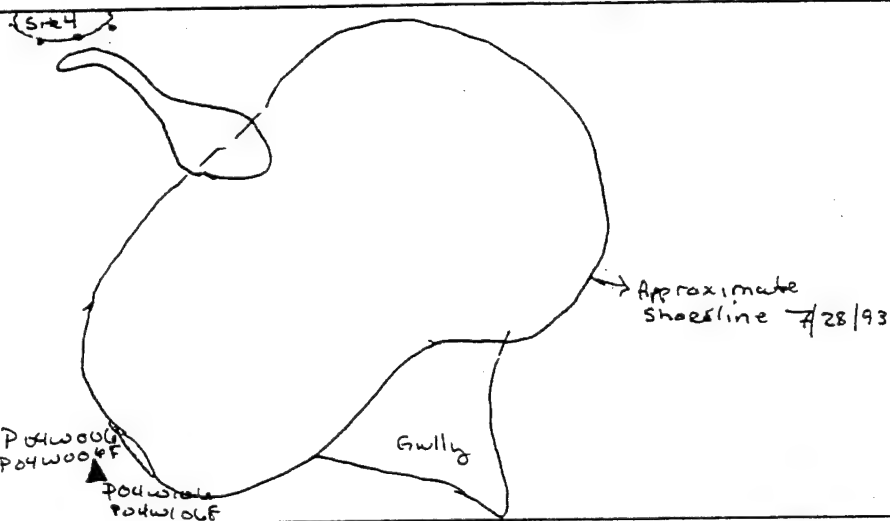
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, Southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W006(F)  
 Duplicate Number P04W106(F)  
 Date 7/30/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North



## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.87 EC 406  $\mu$ S/cm Temperature 57.8°F

## Sampling Information

Analytical Parameter	Sampling Depth	√ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCS	Surface		HCL, 4°C	4 x 40mL glass	P04W006
SVOCs	Surface		, 4°C	2 x 1 Liter glass	P04W006
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W006
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W006
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W006F
VOCS	Surface		HCL, 4°C	4 x 40mL glass	P04W106
SVOCs	Surface		4°C	2 x 1 Liter glass	P04W106
TPH	Surface		HCL, 4°C	1 x 1 Liter glass	P04W106
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W106
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W106F



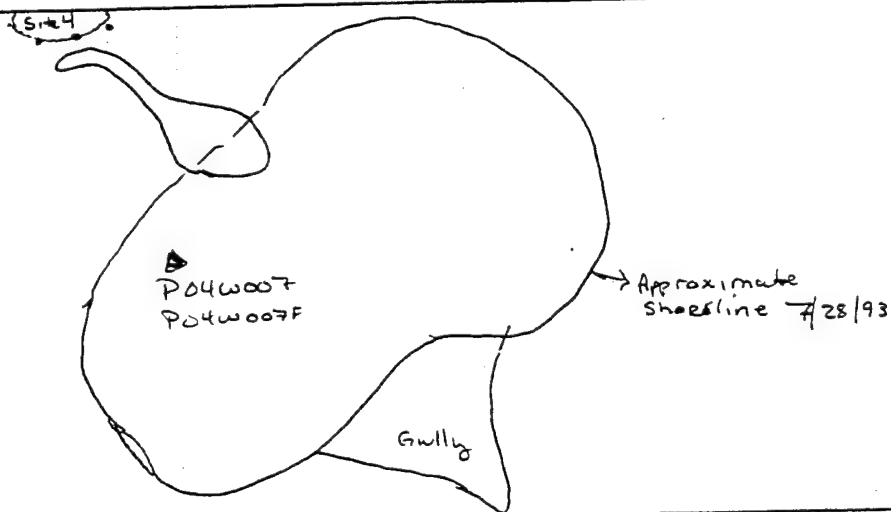
# Surface Water Sampling Record

Project Name Alpena CRTC, MIANG  
 Location Sinkhole, southwest of Site 4  
 Site 4 - surface drainage  
 Recorded By PH Lay  
 Checked By \_\_\_\_\_

Project Number 931800-12  
 Sample Number P04W007 (F)  
 Duplicate Number -  
 Date 7/30/93  
 Date \_\_\_\_\_

## Sampling Point Location (sketch)

← North



\*not to scale

## Water Parameters

Before Sampling: pH \_\_\_\_\_ EC \_\_\_\_\_ Temperature \_\_\_\_\_  
 After Sampling: pH 7.33 EC 336  $\mu$ S/cm Temperature 78.7 °F

## Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	surface		HCl, 4°C	4 x 40mL glass	P04W007
SVOCs	surface		, 4°C	2 x 1 Liter glass	P04W007
TPH	surface		HCl, 4°C	1 x 1 Liter glass	P04W007
PP metals	surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W007
PP metals	surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W007F

# Surface Water Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, southwest of Site 4</u>	Sample Number <u>P04W008 (F)</u>
Site <u>4 - surface drainage</u>	Duplicate Number <u>—</u>
Recorded By <u>PH Lay</u>	Date <u>7/30/93</u>
Checked By <u>—</u>	Date <u>—</u>

Sampling Point Location (sketch)

North

P04W008

Approximate shoreline 7/28/93

Gully

not to scale

Water Parameters

Before Sampling: pH <u>—</u>	EC <u>—</u>	Temperature <u>—</u>
After Sampling: pH <u>7.78</u>	EC <u>314 <math>\mu</math>S/cm</u>	Temperature <u>76.9°F</u>

Sampling Information

Analytical Parameter	Sampling Depth	✓ If Field Filtered	Preservation Method	Volume Required	Sample Bottle I.D.s
VOCs	Surface		HCl, 4°C	4 x 40mL glass	P04W008
SVOCs	Surface		4°C	2 x 1 Liter glass	P04W008
TPH	Surface		HCl, 4°C	1 x 1 Liter glass	P04W008
PP metals	Surface		HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W008
PP metals	Surface	✓	HNO <sub>3</sub> , 4°C	1 x 1 Liter plastic	P04W008F

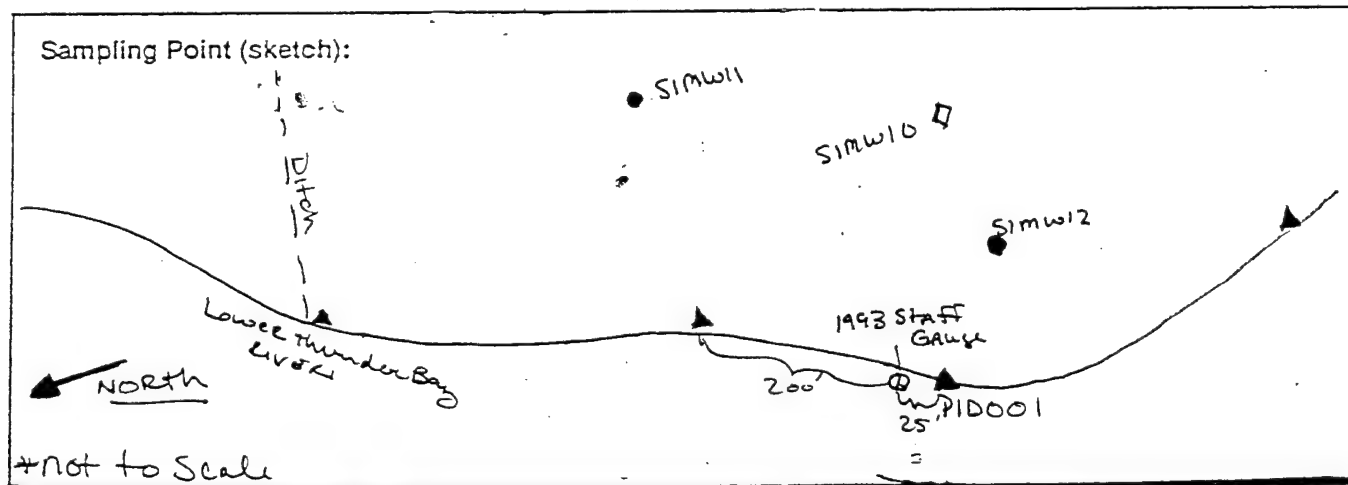
## **Sediment Sampling Forms**



# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collow ANG SW side of Base</u>	Sample Number <u>P1D001</u>
Recorded By <u>P. L. G.</u>	Duplicate Number <u>—</u>
Date <u>9/13/93</u>	Checked By <u>—</u>
Site <u>1 - POL Storage area</u>	Date <u>—</u>

Sampling Equipment <u>Hand Auger, Stainless Steel Spears, auger handle w/ extensions</u>	
Sample Type	Soil <input type="checkbox"/> <u>Sediment</u> <input checked="" type="checkbox"/> Rock <input type="checkbox"/>
Sample Type Description	
USCS Soil Type <u>Sp w/ organics</u>	
Color <u>none</u>	
Odor <u>Drk Brown</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>1</u>	



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input type="checkbox"/> Other <u>—</u>

## Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC MTRNG</u>	Project Number <u>931800-12</u>
Location <u>Phelpsding ANG SW Part of Bas</u>	Sample Number <u>P1D002</u>
Recorded By <u>J. L. G.</u>	Duplicate Number <u>P1D004</u>
Date <u>8/9/13/93</u>	Checked By _____
Site <u>1-POL Storage area</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type      Soil      Sediment      Rock

Sample Type Description

USCS Soil Type Sp

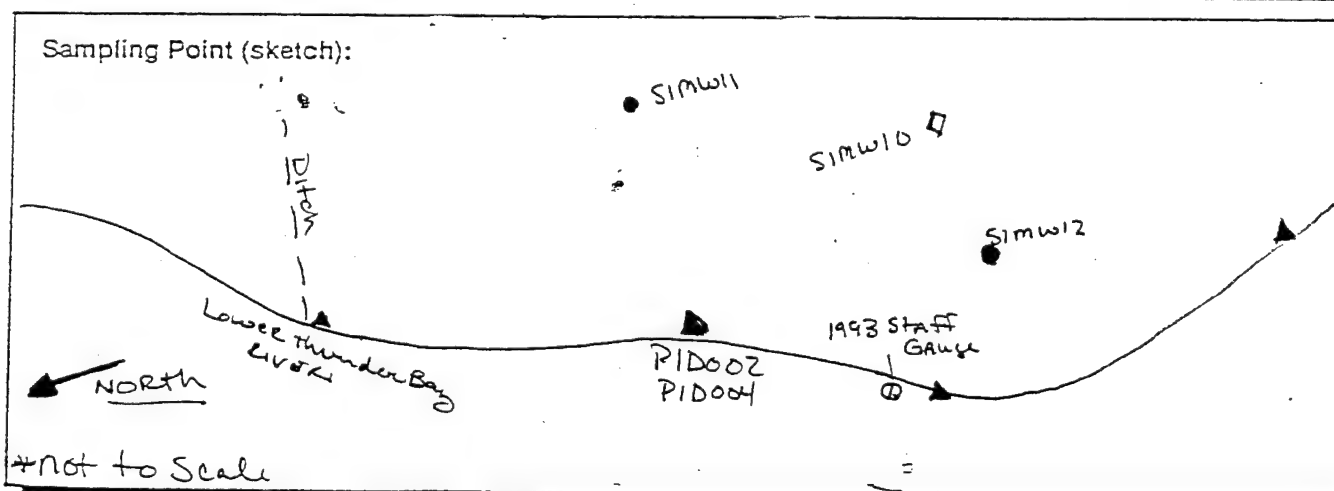
Color Dark Brown - Brown

Odor none

Depth 0-1'

Number of Samples 2

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC MIAWG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collins ANG - SW Port of Base</u>	Sample Number <u>PID003</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>      </u>
Date <u>9/13/93</u>	Checked By <u>      </u>
Site <u>1 - POL Storage Area</u>	Date <u>      </u>

Sampling Equipment HAND Auger, Stainless Steel Spears, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

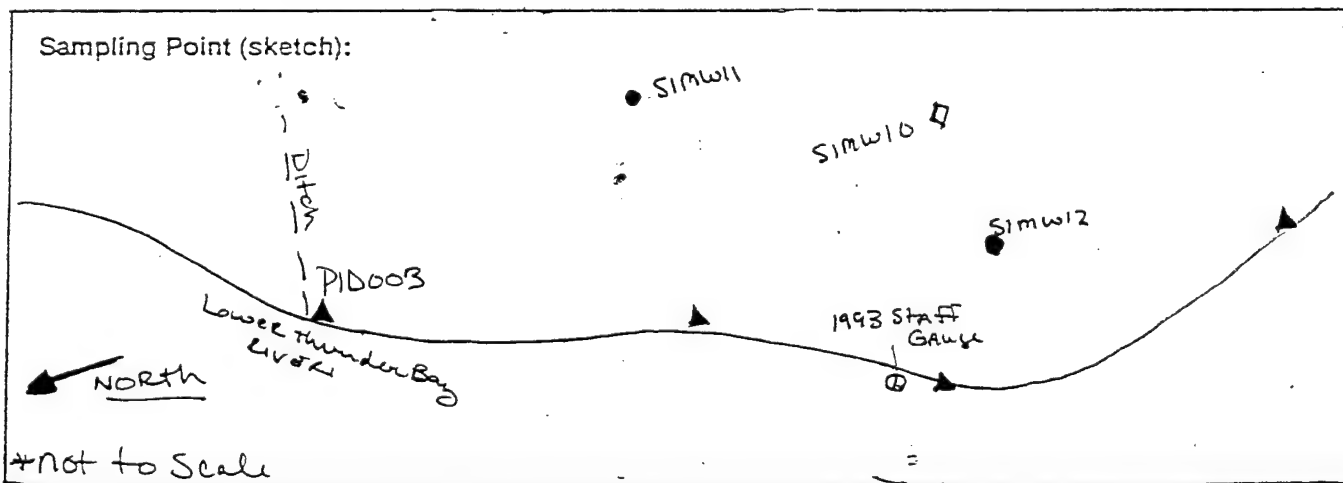
Color Dark Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins AWG. Surface of Base</u>	Sample Number <u>P1D005</u>
Recorded By <u>JH Lay</u>	Duplicate Number <u>      </u>
Date <u>9/13/93</u>	Checked By <u>      </u>
Site <u>1- POL Storage area</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel Spade/s, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

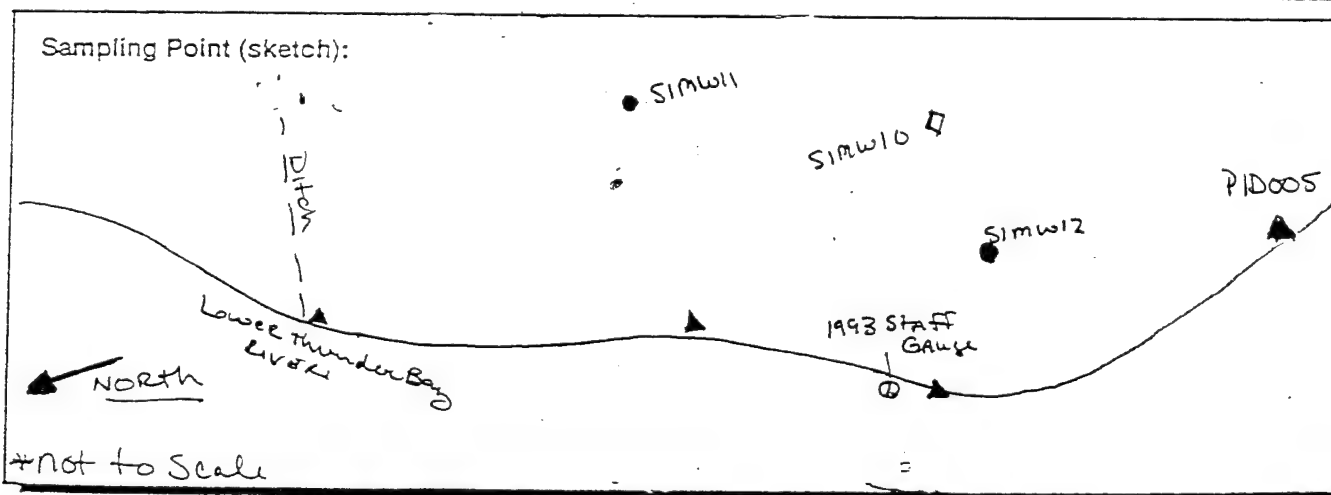
Color Dark Brown

Odor None

Depth 0-1'

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>



# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P01DD01A</u>
Recorded By <u>P. H. Lag</u>	Duplicate Number <u>—</u>
Date <u>7/29/93</u>	Checked By <u>7</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel spoons, auger handle w/ extensions</u>			
Sample Type	Soil	<u>Sediment</u>	Rock
Sample Type Description			
USCS Soil Type <u>Sp w/ organics - sticks, leaves</u>			
Color <u>Brown</u>			
Odor <u>none</u>			
Depth <u>0-1'</u>			
Number of Samples <u>1</u>			
Comments <u>staken at mouth of seep</u> <u>P.H.C.</u> <u>7/29/93</u>			

Sampling Point (sketch):

\*not to scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIAAG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D001</u>
Recorded By <u>JALag</u>	Duplicate Number <u>      </u>
Date <u>7/29/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP w/ organic materials

Color Lt Brown to Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments Sample collected 25' down from mouth of seep, P04W001, P04D001A

Sampling Point (sketch):

← North

\*not to scale

Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D002A</u>
Recorded By <u>J. Lay</u>	Duplicate Number _____
Date <u>7/29/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>
Sample Type                      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>Sp w/ organic rich (sticks, leaves, grease)</u>
Color <u>dk brown-brown</u>
Odor <u>none</u>
Depth <u>0-1'</u>
Number of Samples <u>1</u>
Comments <u>Sample collected</u>

Sampling Point (sketch):

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D002B</u>
Recorded By <u>JAL</u>	Duplicate Number <u>—</u>
Date <u>7/29/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment HAND Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp w/ organics

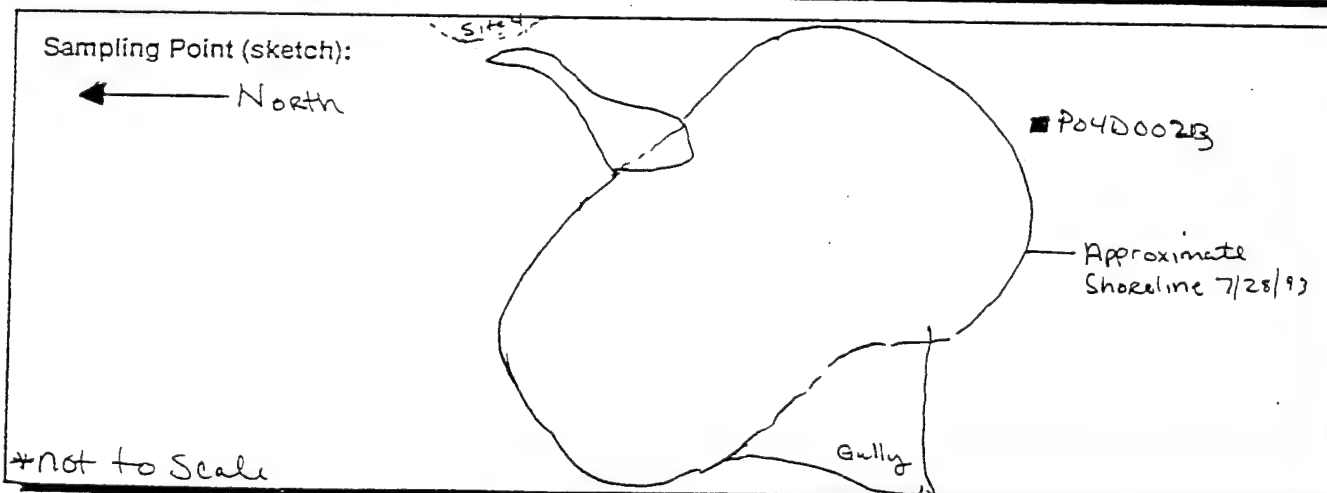
Color Brown

Odor NONE

Depth 0-1'

Number of Samples 1

Comments taken at Potw002, north of deep / being.



Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u><del>PK</del> P04D003</u> <u>7/21/93</u>
Recorded By <u>PLag</u>	Duplicate Number <u>7</u>
Date <u>7-29-93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>	
Sample Type	<div>Soil</div> <div><u>Sediment</u></div> <div>Rock</div>
Sample Type Description	
USCS Soil Type <u>Sp w/organics</u>	
Color <u>Br-Dk Brn</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples _____	
Comments <u>at location P04D003</u>	

Sampling Point (sketch):

← North

P04D003

Approximate Shoreline 7/28/93

Gully

Site 4

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D004A</u>
Recorded By <u>PALay</u>	Duplicate Number <u>      </u>
Date <u>7/30/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

Color Lt Brown

Odor None

Depth 0-1'

Number of Samples 1

Comments collected down from seep at P04D004B  
and P04W004(F)

Sampling Point (sketch):

\*Not to Scale

Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>      </u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIAUG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D004B</u>
Recorded By <u>JALay</u>	Duplicate Number <u>P04D104B</u>
Date <u>7-30-93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>			
Sample Type	Soil	<u>Sediment</u>	Rock
Sample Type Description			
USCS Soil Type <u>SP w/ organics</u>			
Color <u>Bm-Lt Bm</u>			
Odor <u>none</u>			
Depth <u>0-1'</u>			
Number of Samples <u>2</u>			
Comments <u>at seep mouth p04 w004</u>			

Sampling Point (sketch):

\*Not to Scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D005A</u>
Recorded By <u>PAL</u>	Duplicate Number <u>—</u>
Date <u>7/30/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment HAND Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP w/some organics

Color Lt Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments taken down from P04D005B, P04W005

Sampling Point (sketch):

← North

\*not to scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>



# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D0053</u>
Recorded By <u>PALay</u>	Duplicate Number <u>—</u>
Date <u>7/30/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>	
Sample Type	Soil <input type="checkbox"/> <u>Sediment</u> <input checked="" type="checkbox"/> Rock <input type="checkbox"/>
Sample Type Description	
USCS Soil Type <u>Sp w/organics</u>	
Color <u>lt Brwn - Brown</u>	
Odor <u>none</u>	
Depth <u>0-1'</u>	
Number of Samples <u>1</u>	
Comments <u>taken at mouth of seep P04W005</u>	

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D006A</u>
Recorded By <u>PAL</u>	Duplicate Number <u>-</u>
Date <u>7/30/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP w/pebbles

Color Brown

Odor "rotten egg" smell, sulfur

Depth 0-1'

Number of Samples 1

Comments taken down from P04D006B, P04W006

Sampling Point (sketch):

← North

\*not to scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931500-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D006B</u>
Recorded By <u>PALay</u>	Duplicate Number <u>P04D106B</u>
Date <u>7/30/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment HAND AUGER, STAINLESS STEEL SPEARS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp. w/organic

Color Brown

Odor Slight Sulfide odor - "Rotten eggs"

Depth 0.1'

Number of Samples 2

Comments taken at mouth of seep P04W006.

Sampling Point (sketch):

\*not to scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWA</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P040007</u>
Recorded By <u>PLA</u>	Duplicate Number <u>—</u>
Date <u>7/3/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp

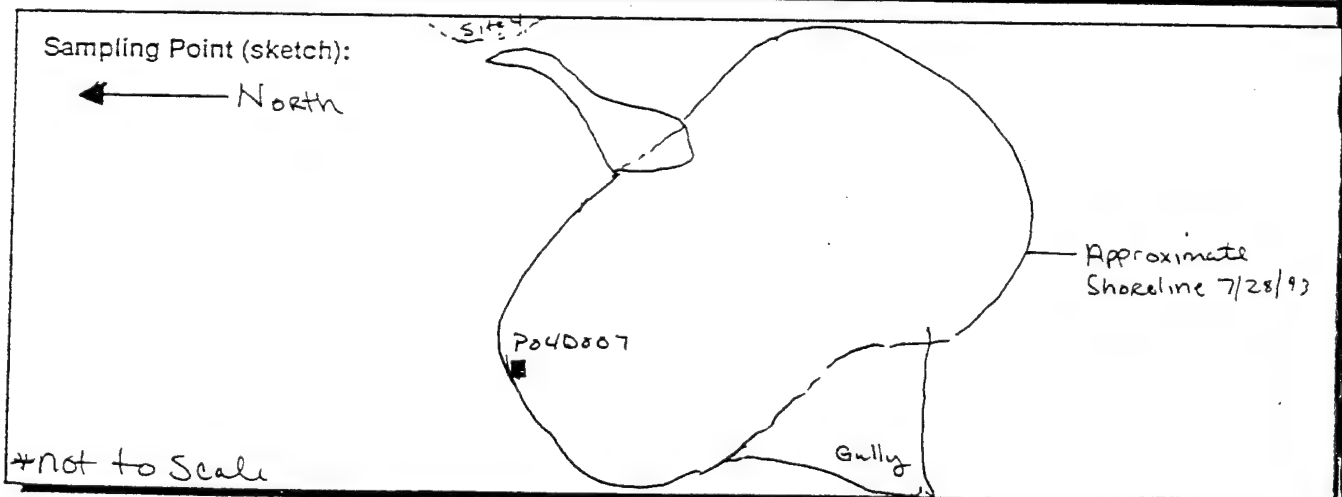
Color Light Brown to Brown

Odor none

Depth 0-1'

Number of Samples 1

Comments taken at a sand boil assoc. w/ seep.



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D008</u>
Recorded By <u>PAL</u>	Duplicate Number <u>      </u>
Date <u>7/31/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment <u>HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions</u>	
Sample Type	<input type="checkbox"/> Soil <input checked="" type="checkbox"/> <u>Sediment</u> <input type="checkbox"/> Rock
Sample Type Description	
USCS Soil Type <u>SP</u>	
Color <u>LT BROWN</u>	
Odor <u>none</u>	
Depth <u>0-1</u>	
Number of Samples <u>1</u>	
Comments <u>      </u>	

Sampling Point (sketch):

\*Not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>      </u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>      </u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D009</u>
Recorded By <u>PAL</u>	Duplicate Number _____
Date <u>7/31/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

Color Lt. Brown - Brown

Odor none

Depth 0-1' - A sample, ~3' B sample

Number of Samples 2

Comments P04D009A collected at 0-1' and P04D009B collected @ 3'

Sampling Point (sketch):

\*Not to Scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D010 (and B)</u>
Recorded By <u>JALag</u>	Duplicate Number <u>      </u>
Date <u>7/31/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spoons, auger handle w/ extensions</u>	
Sample Type	Soil <u>Sediment</u> Rock
Sample Type Description	<u>0-1'</u> <u>3.5-4'</u>
USCS Soil Type	<u>SP</u> <u>SP</u>
Color	<u>Lt Brown - Brown</u> <u>Gray Brown</u>
Odor	<u>none</u> <u>none</u>
Depth	<u>0-1'</u> <u>3.5-4'</u>
Number of Samples	<u>1</u> <u>1</u>
Comments	<u>P04D010A</u> <u>P04D010B</u>

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>      </u>
Type <u>      </u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>      </u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWA</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D011</u>
Recorded By <u>P. Lay</u>	Duplicate Number <u>-</u>
Date <u>8/1/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

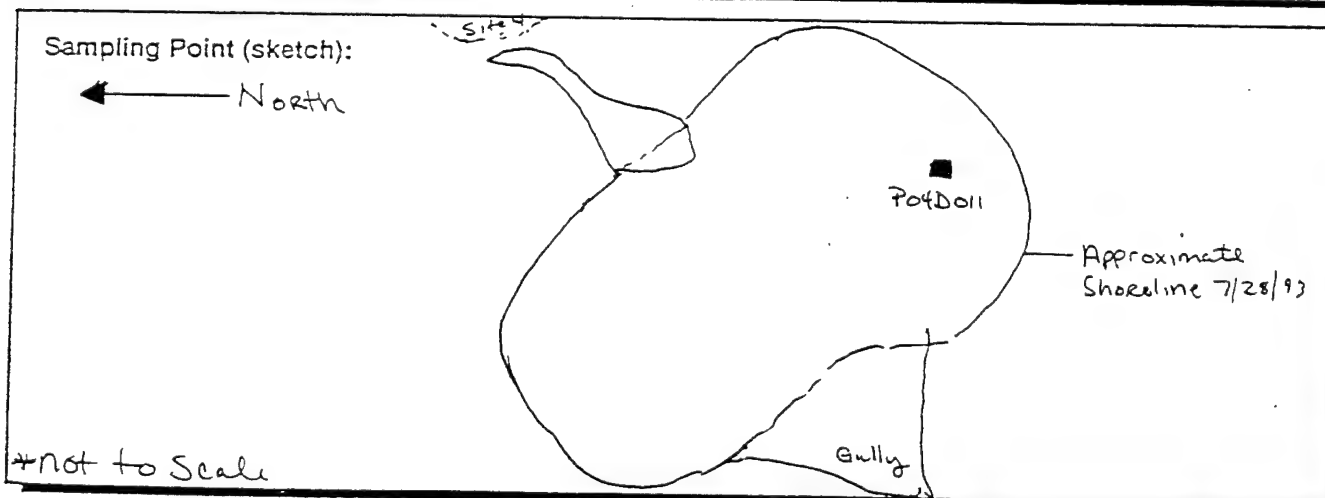
Color Gry Brown - Brown

Odor none

Depth in @ 5' of water 1' from bottom sed

Number of Samples 1

Comments \_\_\_\_\_



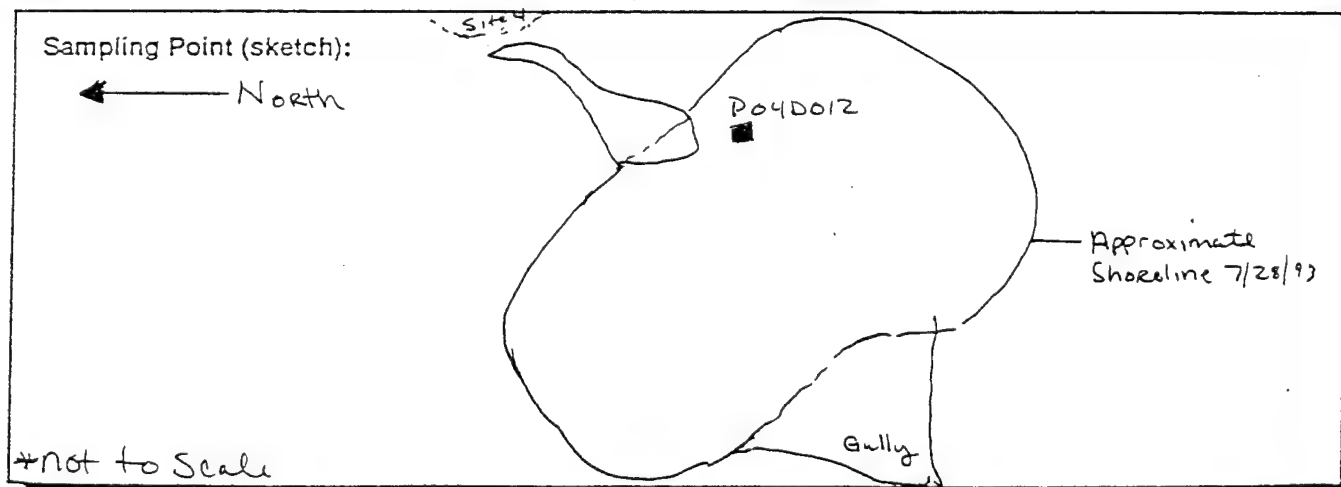
Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: _____
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other _____



## Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D012</u>
Recorded By <u>P. L. Lay</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, STAINLESS Steel spoons, auger handle w/ extensions</u>			
Sample Type	Soil	<u>Sediment</u>	Rock
Sample Type Description			
USCS Soil Type <u>Sp</u>			
Color <u>Grey Brown/Drum</u>			
Odor <u>None</u>			
Depth <u>~5' of water 1' of Bottom sed</u>			
Number of Samples <u>1</u>			
Comments <u>—</u>			



Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger Type <u>—</u> <input type="checkbox"/> Trowel <input type="checkbox"/> Other <u>—</u>	Decontamination Fluids: <u>—</u> <input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol <input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane <input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> ; dilution <input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIAWA</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D013</u>
Recorded By <u>PAL</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOONS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SP

Color Brown

Odor none

Depth at bottom of sinkhole ~1' of sed.

Number of Samples 1

Comments —

Sampling Point (sketch):

\*not to scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTIC, MIAUG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D014</u>
Recorded By <u>PLag</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel spoons, auger handle w/ extensions</u>
Sample Type      Soil <u>Sediment</u> Rock
Sample Type Description
USCS Soil Type <u>Sp</u>
Color <u>Brown</u>
Odor <u>none</u>
Depth <u>1' of sediment</u>
Number of Samples <u>1</u>
Comments <u>—</u>

Sampling Point (sketch):

\*not to scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>—</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water <input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water <input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>	<input checked="" type="checkbox"/> Potable Water <input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input checked="" type="checkbox"/> Deionized Water <input type="checkbox"/> Other <u>—</u>

Form F1026

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MIAUG</u>	Project Number <u>931500-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D015</u>
Recorded By <u>PAL</u>	Duplicate Number <u>P04D115</u>
Date <u>8/1/93</u>	Checked By _____
Site <u>4 drawing of surface water</u>	Date _____

Sampling Equipment HAND AUGER, STAINLESS STEEL SPOOLS, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sp w/ organics

Color Brown

Odor \_\_\_\_\_

Depth water dept ~ 3.5' - 1' of sediment

Number of Samples 2

Comments \_\_\_\_\_

Sampling Point (sketch):

← North

Not to Scale

Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIANG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>PO4D016</u>
Recorded By <u>P. Lag</u>	Duplicate Number <u>-</u>
Date <u>8/1/93</u>	Checked By <u>-</u>
Site <u>4 drawing of surface water</u>	Date <u>-</u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>	
Sample Type	Soil <input type="checkbox"/> <u>Sediment</u> <input checked="" type="checkbox"/> Rock <input type="checkbox"/>
Sample Type Description	
USCS Soil Type <u>Sp</u>	
Color <u>dark Gray</u>	
Odor <u>Strong Fecal odor - sewage-like</u>	
Depth <u>9' of water 1' of sed.</u>	
Number of Samples <u>1</u>	
Comments <u>-</u>	

Sampling Point (sketch):

North

PO4D016

Approximate Shoreline 7/28/93

Gully

not to Scale

Decontamination	
Equipment: <input checked="" type="checkbox"/> Hand auger	Decontamination Fluids: <u>-</u>
Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water
<input type="checkbox"/> Trowel	<input checked="" type="checkbox"/> Detergent/water
<input type="checkbox"/> Other <u>-</u>	<input checked="" type="checkbox"/> Potable Water
	<input checked="" type="checkbox"/> Deionized Water
	<input checked="" type="checkbox"/> Methanol
	<input type="checkbox"/> Hexane
	<input type="checkbox"/> HNO <sub>3</sub> : dilution
	<input type="checkbox"/> Other <u>-</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04D017</u>
Recorded By <u>PAL</u>	Duplicate Number <u>      </u>
Date <u>8/1/93</u>	Checked By <u>      </u>
Site <u>4 drawing of surface water</u>	Date <u>      </u>

Sampling Equipment Hand Auger, Stainless Steel Spools, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type SC w/ organics

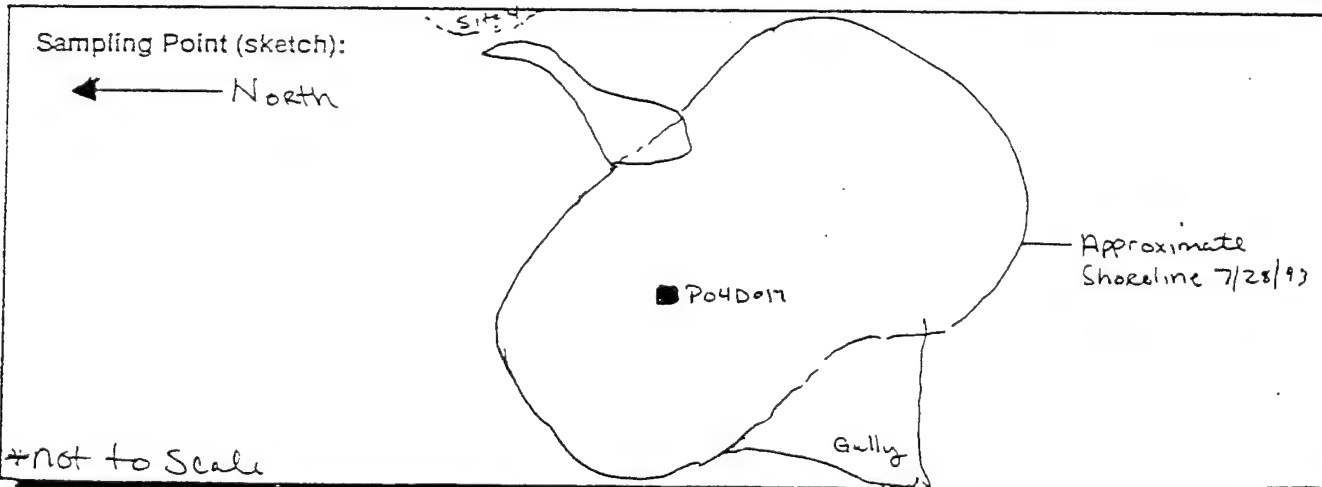
Color Gry-Brown

Odor Fetid odor - sewage smell

Depth 13' of water 2.8' of sed.

Number of Samples 1

Comments       



Decontamination		Decontamination Fluids: <u>      </u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>      </u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>      </u>

## Soil/Sediment Sampling Record

Project Name <u>Alpena CRTC, MICHIGAN</u>	Project Number <u>931800-12</u>
Location <u>Sinkhole, SW of Site 4</u>	Sample Number <u>P04DDB</u>
Recorded By <u>PAL</u>	Duplicate Number <u>—</u>
Date <u>8/1/93</u>	Checked By <u>—</u>
Site <u>4 drawing of surface water</u>	Date <u>—</u>

Sampling Equipment <u>HAND Auger, Stainless Steel Spools, auger handle w/ extensions</u>	
Sample Type	Soil <input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Rock <input type="checkbox"/>
Sample Type Description	
USCS Soil Type <u>SC w/ organics</u>	
Color <u>dark Grey</u>	
Odor <u>Slight hydrocarbon odor</u>	
Depth <u>19' of water</u>	
Number of Samples <u>1</u>	
Comments <u>—</u>	

Sampling Point (sketch):

\*not to scale

Decontamination		Decontamination Fluids: <u>—</u>	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other <u>—</u>		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> : dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other <u>—</u>

# Soil/Sediment Sampling Record

Project Name <u>Alpena CRIC, MIANG</u>	Project Number <u>931500-12</u>
Location <u>Phelps Collins ANG - Landfill</u>	Sample Number <u>P06D01</u>
Recorded By <u>PHL</u>	Duplicate Number _____
Date <u>8/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment Hand Auger, Stainless Steel Spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sand and organic muck -

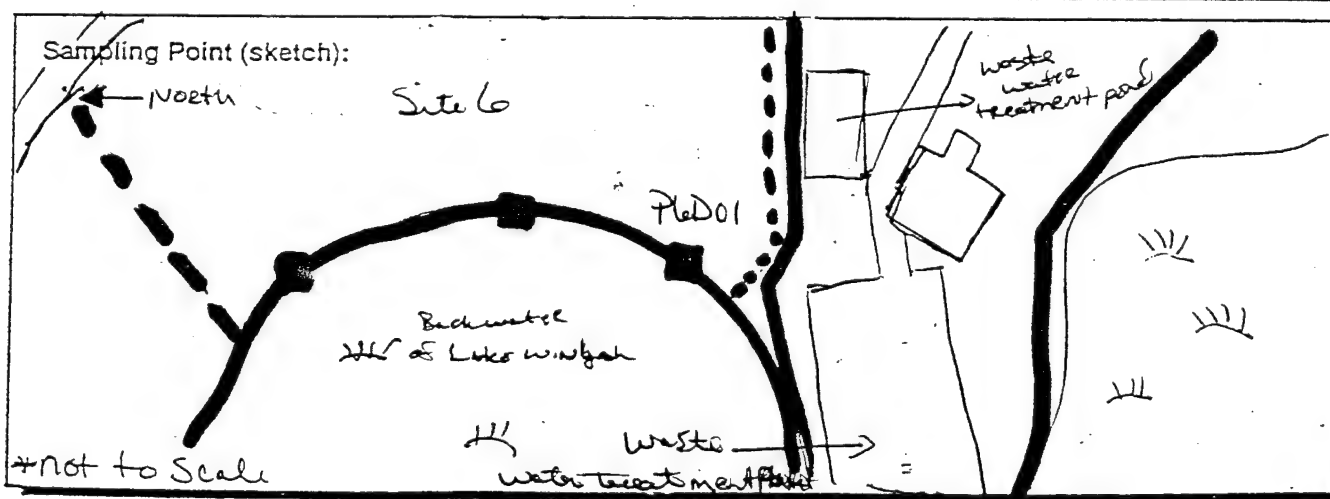
Color Black

Odor Fetid - sewage

Depth 0-1'

Number of Samples 1

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____



# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC MIANG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins ANG - Landfill</u>	Sample Number <u>P666DOZ</u> <small>8/17/93</small>
Recorded By <u>PHL</u>	Duplicate Number _____
Date <u>8/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment HAND AUGER, STAINLESS STEEL SPINDS, AUGER HANDLE w/ EXTENSIONS

Sample Type      Soil      Sediment      Rock

Sample Type Description

USCS Soil Type SC w/ asphalt and other fill material

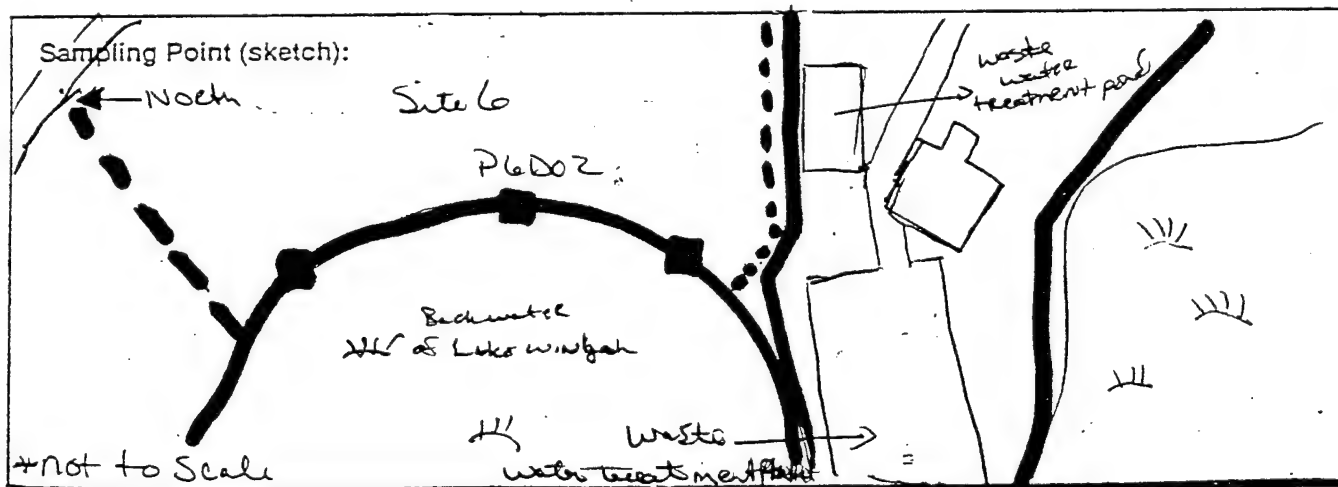
Color Blk

Odor Sated

Depth 0-1'

Number of Samples 1

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids:	
Equipment: <input checked="" type="checkbox"/> Hand auger		<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
Type <u>AMS</u>		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

# Soil/Sediment Sampling Record

Project Name <u>Alpena LRTC, MIAWG</u>	Project Number <u>931800-12</u>
Location <u>Phelps Collins ANG - Land fill</u>	Sample Number <u>P6D03</u>
Recorded By <u>P+Lay</u>	Duplicate Number <u>P6D04</u>
Date <u>9/17/93</u>	Checked By _____
Site <u>LF 6</u>	Date _____

Sampling Equipment HAND Auger, Stainless Steel spoons, auger handle w/ extensions

Sample Type                      Soil                      Sediment                      Rock

Sample Type Description

USCS Soil Type Sand and clay w/ organics

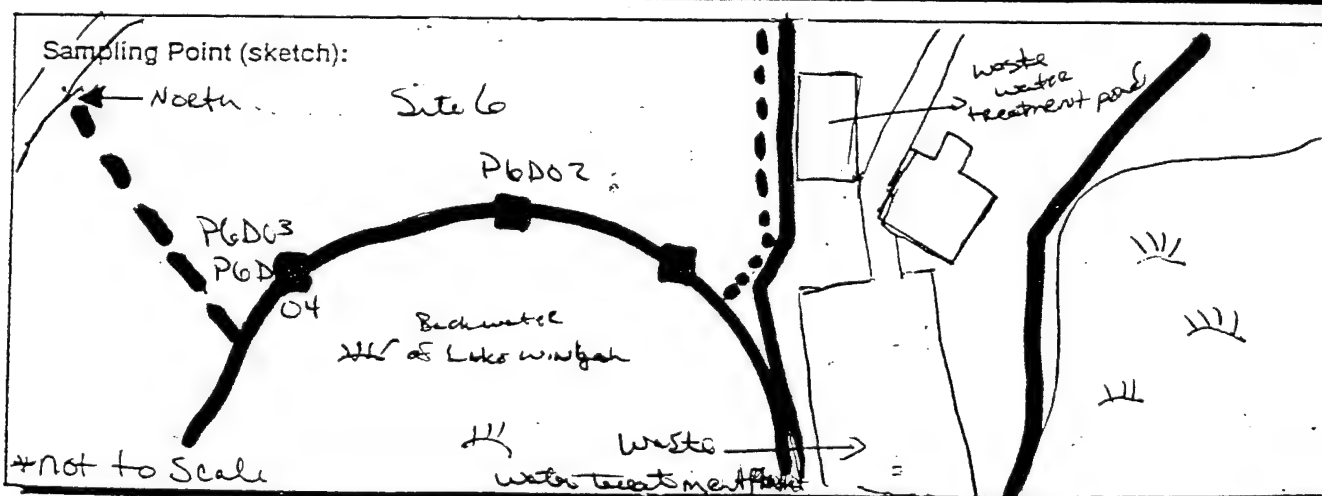
Color BLK

Odor Fetid

Depth 0-1'

Number of Samples 2

Comments \_\_\_\_\_



Decontamination		Decontamination Fluids: _____	
Equipment: <input checked="" type="checkbox"/> Hand auger	Type <u>AMS</u>	<input type="checkbox"/> Steam/Hot Water	<input checked="" type="checkbox"/> Methanol
<input type="checkbox"/> Trowel		<input checked="" type="checkbox"/> Detergent/water	<input type="checkbox"/> Hexane
<input type="checkbox"/> Other _____		<input checked="" type="checkbox"/> Potable Water	<input type="checkbox"/> HNO <sub>3</sub> ; dilution
		<input checked="" type="checkbox"/> Deionized Water	<input type="checkbox"/> Other _____

**Appendix G: Monitoring Well Development  
and Sampling Forms**

## Well Development/Purge Log

G-1

[illegible]

1 ft length of 4" = 0.087 lb3 or 0.65 gal  
1 ft length of 2" = 0.022 lb3 or 0.16 gal

Form F-1003  
2/1/91

Recorded By DP Taylor Date 8/28/93  
 Checked By PLC Date 9/22/93

Pump Bore

Pump Broken

Project Name	Phelps Collins ANG		Project No.	931800
PID/FID Readings	—	(Ambient)	—	(Well Mouth)
Static Levels	—	(Product)	4.14'	(Water)
Pump <input checked="" type="checkbox"/> / Bail <input type="checkbox"/> Rate	Total Gal. Extracted 20 gals			
Water Column Length	8.86'	Well Volumes Extracted 20-14		
Disposition of Discharge Water (Containerized) and sampled for disposal				
Specific Capacity	—	(gpm/ft. drawdown)	After	— Hrs.

[illegible]

radius 1 ft length of  $4'' = 0.08713$  or 0.65 gal

1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By Dr. J. A. W.

Checked By PHL

Date \_\_\_\_\_ Form F-1003

Date 9/22/93 21/91

## Well Development/Purge Log

Equipment Information

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. 14300# 2015

Conductivity Meter No. ET

Thermometer No. 14300# 2015

Well Information	
Number	S1 MW 3
Location	S1, V1
Datum	Tecatch
Elev. Datum Point	
Ground Elev.	3.79'
Well Diameter	2"
Well Depth	13.18'
Well Material	PVC

Project Name Phelps Collins Ave Project No. 931800  
 PFD/FID Readings — (Ambient) — (Well Mouth)  
 Static Levels — (Product) 3.79' (Water)  
 Pump ☒ / Bail ☐ Rate — Total Gal. Extracted 18  
 Water Column Length 9.39' Well Volumes Extracted 12  
 Disposition of Discharge Water Containerized and Sampled For disposal  
 Specific Capacity — (gpm/ft. drawdown) After — Hrs. —

[illegible]

1 ft length of 4" = 0.087 lb  
 1 ft length of 2" = 0.022 lb

Recorded By DPJayne Date 8/28/93 Form F-1003  
Checked By PALCay Date 9/22/93 9/1/91

## Well Development/Purge Log

Project Name Phelps Collins Ave Project No. \_\_\_\_\_  
 P/U/F/U Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)  
 Static Levels \_\_\_\_\_ (Product) 2.34' \_\_\_\_\_ (Water)  
 Pump ☐ / Bail ☒ Rate \_\_\_\_\_ Total Gal. Extracted 20  
 Water Column Length 10.9 Well Volumes Extracted 11.5  
 Disposition of Discharge Water containerized and sampled for disposal  
 Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs

[illegible]1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Date 9/1/91 Form F-1003 9/1/91

## Well Development/Purge Log

**Equipment Information**

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. \_\_\_\_\_

Conductivity Meter No. \_\_\_\_\_

Thermometer No. \_\_\_\_\_

[illegible]

Plots	1 ft length of 4" = 0.087 fl.3	or 0.65 gal	note: water had noticeable hydrocarbon odor
	1 ft length of 2" = 0.022 fl.3	or 0.16 gal	

Recorded By DFayne Date 9/10/93 Form F-1001  
Checked By Pateuch Lay Date 9/22/93 9/1/91



[illegible]

1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
 1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DPJaw Date 9/10/93  
 Checked By 144

Form F-1003  
2/1/91

## Well Development/Purge Log

Project Name Phelps Collins AP6 Project No. 931800

P(F)/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 6.34' \_\_\_\_\_ (Water)

Pump ☒ Bail ☐ Rate Grand Eos Total Gal. Extracted 40

Water Column Length 26.66 Well Volumes Extracted ~9.6

Disposition of Discharge Water Contained in 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) Alter \_\_\_\_\_ Hrs.

[illegible]

Photos 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DE Jayne Date 9/12/93  
Checked By PH Cane Date 9/22/93

Form F-1003  
9/1/91



-16-

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Well Volumes

Date 9/22/93

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Equipment Information

Bailer No. \_\_\_\_\_

Pump No. \_\_\_\_\_

Interface Probe No. \_\_\_\_\_

Sounder No. \_\_\_\_\_

pH Meter No. <sup>DP-3</sup> ~~4020~~ 2015

Conductivity Meter No. ET

Thermometer No. 2015 A-2-CO

[illegible]

**Notes.** 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DR Jayne  
Checked By FH Long

Date 6/28/93 Form F-1003  
9/1/91

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 931800-12

PID/FID Readings — (Ambient) — (Well Mouth)

Static Levels — (Product) 14.5' (Water)

Pump ☒ /Bail ☐ Rate Ground Fuel Total Gal. Extracted 215

Water Column Length 8.09' Well Volumes Extracted —

(Disposition of Discharge Water Contained in 55 gallon drum)

Specific Capacity — (gpm/ft. drawdown) After — Hrs.

[illegible]

Flows: 1 ft length of 4" = 0.087 fl3 or 0.65 gal  
1 ft length of 2" = 0.022 fl3 or 0.16 gal

Recorded By JKayne Date 9/16/93 Form F 1003  
Checked By \_\_\_\_\_ Date 9/1/91



# Well Development/Purge Log

Project Name Phelps Collins AN6 Project Number 931800 Page 1 of 1  
Well No. 525 MWS Datum Point " pH Meter Number 10200 # 3083 Date 8/25/93  
Location " Elevation of Datum Point TOC Conductivity Meter Number " Recorded By DFE/ymc  
Dev/Purge Method Boiler Static Water Level 6.74' Thermometer Number " Checked By "  
Equipment 2" Grundfos Pump Well Depth 16' Casing Diameter 2" Date 8/25/93  
Water Column " Average Discharge Rate 1.5 gpm  
Disposition of Discharge Water " Well Volumes "  
Specific Capacity " gpm/ft. of draw down after 3 hours

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. $\mu$ mhos/cm	Turbidity NTU	Gallons Dev./Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1011	1.5 gpm	25.4	7.49	0.620	+1000			muddy
1016	1.5 gpm	27.2	7.62	0.618	+1000	79		muddy
1018	1.5 gpm	25.4	7.61	0.587	+1000	108		muddy
1021	1.5 gpm	25.1	7.55	0.564	+1000	157		slightly clear
1025	1.5 gpm	25.3	7.55	0.584	+688	189		slightly clear
1029	1.5 gpm	27.4	7.59	0.558	142	27		mildly clear
1031	1.5 gpm	27.9	7.61	0.556	151	31	7.98'	
1032							7.4'	
1033							7.2'	
1034							7.08'	
1035							6.98'	

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

# Well Development/Purge Log

Project Name Phelps Collins ANG Project Number HAZCO# 3083 Date 8/25/93 Page 1 of 1

Well No. SFS MW 6 Datum Point " Conductivity Meter Number " Recorded By JSJ

Location " Elevation of Datum Point " Thermometer Number " Checked By "

Dev/Purge Method Grout/Fus Pump Static Water Level 6.78 Casing Diameter 2" Date "

Equipment " Well Depth 15.4 Average Discharge Rate "

Water Column " Total Gallons Extracted " Well Volumes "

Disposition of Discharge Water "

Specific Capacity " gpm/ft. of draw down after " hours

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. µmhos/cm	Turbidity NTU	Gallons Dev/Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1040	~3 gpm	28.1	7.58	0.322	4000		-	muddy
1045	1.5 gpm	30.2	7.62	0.290	+1000	-15	-	muddy
1049	1.5 gpm	26.5	7.52	0.316	+1000	-18	-	muddy
1054	1.5 gpm	27.73	7.57	0.309	+1000	25.5	-	muddy
1058	1.5 gpm	27.2	7.6	0.318	+1000	28.0	-	muddy
1102	1.5 gpm	29.8	7.45	0.343	+1000	31	-	slightly clear
1105	1.5 gpm	25.1	7.61	0.330	1000	35.5	-	slightly clear
1112	1.5 gpm	25.4	7.52	0.354	549	46	-	clear
1114							7.36'	
1115							7.10'	
1116							7.06'	
1117							7.02'	

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal



[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

## Well Development/Purge Log

Project Name Delphi Collins A16 Project No. 93/800-12

PID/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 7.08' (Water)

Pump ☒ /Ball ☐ Rate Groundfos Total Gal. Extracted 22.5

Water Column Length \_\_\_\_\_ Well Volumes Extracted \_\_\_\_\_

Disposition of Discharge Water Contained in a 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs.

[illegible]

1 ft length of 1" = 0.087 l/3 or 0.65 gal  
1 ft length of 2" = 0.022 ft 3 or 0.16 gal

Recorded By DF4402 Date 9/13/93 Form F-1003  
Checked By PH44 Date 9/22/93 9/1/91

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 93/810

Pit/FID Readings \_\_\_\_\_ (Ambient) \_\_\_\_\_ (Well Mouth)

Static Levels \_\_\_\_\_ (Product) 7.32' \_\_\_\_\_ (Water)

Pump ☒ / Bail ☐ Rate \_\_\_\_\_ Total Gal. Extracted \_\_\_\_\_

Water Column Length \_\_\_\_\_ Well Volumes Extracted \_\_\_\_\_

Disposition of Discharge Water Contained in 55 gallon drum

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs. \_\_\_\_\_

Station	Depth (m)	Temperature (°C)	Salinity (psu)	Density (kg/m³)	Specific Gravity	Notes
0856	2.5 gpm					
0858						
0859						

Recorded By DFJ/ane Date 9/12/93 Form F-1003  
Checked By phl/ey Date 9/27/93 9/1/91

# Well Development/Purge Log

Project Name Phelps Collins AN6 Project Number 931800 pH Meter Number Harco # 3083 Date 8/25/93  
 Well No. LFE mw 4 Datum Point Toc Conductivity Meter Number " Recorded By DFE  
 Location Landfill 6 Elevation of Datum Point 100 Thermometer Number " Checked By "  
 Dev/Purge Method 2" Grundfos Rediflow Static Water Level 12.24 Casing Diameter 2" Date "  
 Equipment 3/4" pipe Well Depth 20' Average Discharge Rate 1.5 gal/min  
 Water Column 7.76' Total Gallons Extracted " Well Volumes "  
 Disposition of Discharge Water "  
 Specific Capacity " of draw down after " hours

Time (24 hr.)	Flow Rate	Water Temp. In C°	pH	Cond. µmhos/cm	Turbidity NTU	Gallons Dev/Purge Before Meas.	Water Level (feet)	Remarks (e.g. clarity)
1414	~1.5g	24.5°C	7.30	.289	+1000	0	12.24	Muddy
1419	1.5g	26.7°C	7.22	.275	+1000	8g	—	AS
1424	1.5g	27.3°C	7.22	.274	+1000	15g	—	AS
1429	1.5g	26.7°C	7.21	.272	+1000	23g	—	AS
1434	1.5g	26.8°C	7.21	.273	+1000	30g	—	Sl. less muddy
1439	1.5g	26.7°C	7.21	.272	398	38g	—	less turb.
1444	1.5g	26.6°C	7.22	.274	176	45g	—	less turb.
1447								13.12' H <sub>2</sub> O level
1448								12.96' H <sub>2</sub> O lev.
1449								12.80' H <sub>2</sub> O lev.

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
 1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

7.76 x .16 =

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 931800

PID/FID Readings — (Ambient) — (Well Mouth)  
Static Levels — (Product) 11.17' (Water)

Pump ☒ Ball ☐ Rate Ground PPS Total Gal. Extracted 35

Water Column Length — Well Volumes Extracted —

Disposition of Discharge Water Contained in poly tank

Specific Capacity — (gpm/ft. drawdown) After — Hrs.

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft 1 of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By DK-Jayal  
Checked By \_\_\_\_\_

Date 8/25/93

Form F-1003  
3/15/92



pH Meter Number 11420 # 3083  
 Conductivity Meter Number " "  
 Thermometer Number " "  
 Casing Diameter 2  
 Average Discharge Rate \_\_\_\_\_  
 Well Volumes \_\_\_\_\_

Date 8/25/93  
 Recorded By DF Sayre  
 Checked By \_\_\_\_\_  
 Date \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

[illegible]

**G-23**

Figure 3-1





Flow rate not constant.

- water temp high due to water circulating through the pump.

Figure 3-1

## Well Development/Purge Log

Project Name Phelps Collins AN6 Project No. 931800

PID/FID Readings — (Ambient) — (Well Mouth)

Static Levels — (Product) 11' (Water)

Pump ☒ /Ball ☐ Rate 1.1 Ltr/bailer Total Gal. Extracted 15

Water Column Length 4' Well Volumes Extracted 23.5

Disposition of Discharge Water Containerized in poly tank

Specific Capacity \_\_\_\_\_ (gpm/ft. drawdown) After \_\_\_\_\_ Hrs. \_\_\_\_\_

[illegible]

Notes: 1 ft length of 4" = 0.087 lb3 or 0.65 gal  
1 ft 1 of 2" = 0.022 lb3 or 0.16 gal

Recorded By DTeyne  
Checked By PHCey

Date 9/14/93  
Date 9/22/93

Form F-1003  
3/15/92

## Well Development/Purge Log

[illegible]

1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
 1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Recorded By AK Jayne Date 7/12/93 Form F-1003 9/1/91

Checked By P. L. G. Date 9/22/93



Page \_\_\_\_\_ of \_\_\_\_\_

pH Meter Number H2250 # 2015 Date 8/31/93  
Conductivity Meter Number FEIC Recorded By DF Jayne  
Thermometer Number H2250 # 2015 Checked By H2250  
Casing Diameter 2' Date \_\_\_\_\_  
Average Discharge Rate \_\_\_\_\_  
Well Volumes \_\_\_\_\_

Specific Capacity \_\_\_\_\_ gpm/ft. of draw down after \_\_\_\_\_ hours

[illegible]

Notes: 1 ft length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal  
1 ft length of 2" = 0.022 ft<sup>3</sup> or 0.16 gal



## **Monitoring Well Sampling Forms**



# GROUNDWATER SAMPLING

Sample ID: P1mw1gw4

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/14/93  
 WELL NO. MW1 LOCATION Site 1 Old P6L  
 WEATHER CONDITIONS Cool, Rainy AMBIENT TEMP: \_\_\_\_\_  
 PERSONNEL PHCag, JF DF Jayne  
 REVIEWED BY: DEF

EQUIPMENT USED: Bailer, rope, hand pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P9mw6

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P9mw6

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) - 0.3  
 Depth to bottom of well (ft.) 12.85'  
 Depth to water surface (ft.) 1.65'  
 Length of water (ft.) 11.2'  
 Volume of water (ft<sup>3</sup>) 0.2464  
 (gal.) 1.8  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 2120 Finished 2140  
 Volume purged 10  
 Comments on Well Recovery immediate  
 Additional Comments -  
 Samples Collected: Start 1415  
 Finish 1430

IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>				
	Time: <u>2120</u>	<u>2130</u>	<u>2146</u>				
Water Level	<u>1.65</u>	<u>-</u>	<u>1.66</u>				
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>				
Turbidity	<u>SI</u>	<u>mod</u>	<u>mod</u>				
Odor	<u>SI</u>	<u>SI</u>	<u>SI</u>				
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>				
pH (units)	<u>unable to calibrate</u>						
Conductivity ( $\mu$ mhos)	<u>PH and conductivity</u>						
Water Temperature (°C)	<u>62.5</u>	<u>63.4</u>	<u>62.8</u>				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91



# GROUNDWATER SAMPLING

Sample ID: P1mw2Gw4

PROJECT NAME Phelps Collins ANG RI JOB NO: 931800-12 DATE: 9/1/93  
 WELL NO. MW2 LOCATION Site 1  
 WEATHER CONDITIONS Sunny, windy AMBIENT TEMP: ~68°F  
 PERSONNEL Phelps, J. B. Norton  
 REVIEWED BY: DPJ

EQUIPMENT USED: Pump, Bailer, hose, ROPE

## PURGING DEVICE

Type Device? Pump  
 How was the device decontaminated? See logbook  
 How was the <sup>ROSE</sup> ~~line~~ decontaminated? Alconox + DI wash to rinse  
 Which well was previously purged? P2mw7

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox + DI wash to rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P2mw7

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) -0.3'  
 Depth to bottom of well (ft.) 12.92  
 Depth to water surface (ft.) 3.72  
 Length of water (ft.) 9.2  
 Volume of water (ft<sup>3</sup>) 0.2024  
 (gal.) ~1.47  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 1505 Finished 1536  
 Volume purged 7.5 gallons  
 Comments on Well Recovery Immediate  
 Additional Comments -  
 Samples Collected: Start 1540  
 Finish 1600

IN-SITU TESTING	Date:	9/1/93	9/1/93	9/1/93	9/1/93	9/1/93	9/1/93
	Time:	1505	1509	1516	1522	1530	1536
Water Level		3.72'					3.74'
Well Volume Purged (gal.)		initial	1	2.5	4.5	6	7.5
Turbidity		SI.	SI	SI	SI.	SI.	SI
Odor		none	none	none	none	none	none
Organic Vapor (ppm)		-	-	-	-	-	-
pH (units)		6.63	7.04	7.53	7.76	7.79	7.55
Conductivity (μ mhos)		349	373	429	430	421	404
Water Temperature (°C)		67.9	65.2	65.3	65.2	64.7	64.8

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1mw36w4

PROJECT NAME Phillips Collins ANG RT JOB NO: 931800-12 DATE: 9/10/93  
 WELL NO. mw3 LOCATION Site 1  
 WEATHER CONDITIONS Sunny, Windy AMBIENT TEMP: -58°F  
 PERSONNEL Phleg and BF Norton  
 REVIEWED BY: DFT

EQUIPMENT USED: Pump, Bailor, Rope, hose

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Pump</u>	Type Device? <u>Bailor</u>
How was the device decontaminated? <u>See logbook</u>	How was the device decontaminated? <u>see logbook</u>
How was the line decontaminated? <u>See logbook</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>P3mw4</u>	Which well was previously sampled? <u>P1mw4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1448</u> Finished <u>1518</u>
Stickup (ft.) <u>-0.3</u>	Volume purged <u>8.5 gals</u>
Depth to bottom of well (ft.) <u>13'</u>	Comments on Well Recovery <u>immediate</u>
Depth to water surface (ft.) <u>3.36'</u>	Additional Comments <u>—</u>
Length of water (ft.) <u>9.64</u>	
Volume of water (ft <sup>3</sup> ) <u>6.212</u>	
(gal.) <u>~1.54</u>	
Amount of sediment at bottom of well (ft.) <u>—</u>	Sample Collected: Start <u>1520</u>
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>	Finish <u>1530</u>

IN-SITU TESTING	Date: 9/10/93	9/10/93	9/10/93	9/10/93	9/10/93		
Date:	9/10/93	9/10/93	9/10/93	9/10/93	9/10/93		
Time:	1448	1454	1504	1510	1518		
Water Level	3.36				3.37		
Well Volume Purged (gal.)	Initial	2	4	6	8		
Turbidity	None	sl.	sl	sl	sl		
Odor	none	sl	sl	sl	noticeable		
Organic Vapor (ppm)	—						
pH (units)	8.68	7.16	7.7	7.38	7.33		
Conductivity (μ mhos)	962	976	982	979	977		
Water Temperature (°C)	61.3	62.3	60.9	60.6	60.4		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1mw46w4

PROJECT NAME <u>Phelps Collins ANG RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/10/93</u>	
WELL NO. <u>mw4</u>		LOCATION <u>Site 1</u>			
WEATHER CONDITIONS <u>Cool, Rainy (Light)</u>		AMBIENT TEMP: <u>~55°F</u>			
PERSONNEL <u>P.H. Lay</u> <u>C.R.F. Norton</u>					
REVIEWED BY: <u>DEJ</u>					
EQUIPMENT USED: <u>Bailer, rope, pump assembly, G.W. filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P6mw4</u>			Which well was previously sampled? <u>P6mw9</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1105</u> Finished <u>1125</u>		
Stickup (ft.) <u>-0.3</u>			Volume purged <u>8</u>		
Depth to bottom of well (ft.) <u>13.2'</u>			Comments on Well Recovery <u>immediate</u>		
Depth to water surface (ft.) <u>12.54'</u>			Additional Comments _____		
Length of water (ft.) <u>10.66</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.23</u>			_____		
(gal.) <u>~1.7</u>			_____		
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1235</u>		
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1245</u>		
IN-SITU TESTING					
Date:	<u>9/10/92</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>	<u>9/10/93</u>
Time:	<u>1105</u>	<u>1110</u>	<u>1115</u>	<u>1120</u>	<u>1125</u>
Water Level	<u>2.54'</u>	_____	_____	_____	<u>2.55</u>
Well Volume Purged (gal.)	<u>init. gal</u>	<u>3</u>	<u>5</u>	<u>6.5</u>	<u>8</u>
Turbidity	<u>SI.</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>	<u>SI.</u>
Organic Vapor (ppm)	_____	_____	_____	_____	_____
pH (units)	<u>7.27</u>	<u>7.25</u>	<u>7.19</u>	<u>7.33</u>	<u>7.13</u>
Conductivity (µ mhos)	<u>271</u>	<u>324</u>	<u>321</u>	<u>291</u>	<u>303</u>
Water Temperature (°C)	<u>61.0</u>	<u>63.0</u>	<u>63.2</u>	<u>62.3</u>	<u>61.6</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal					
Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P1mw06w04

PROJECT NAME Phelps Collins ANG RI JOB NO: 931800-12 DATE: 9/15/93  
 WELL NO. m06 LOCATION Site 1  
 WEATHER CONDITIONS Rainy, cool AMBIENT TEMP: -50°  
 PERSONNEL P. Hays and D. J. Jager  
 REVIEWED BY: DJJ

EQUIPMENT USED: Bailer, rope, pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? Simw1

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P1mw1

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) -2  
 Depth to bottom of well (ft.) 14.95  
 Depth to water surface (ft.) 4.31  
 Length of water (ft.) 10.64'  
 Volume of water (ft<sup>3</sup>) 0.234  
 (gal.) 1.7 gals  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 0940 Finished 1000  
 Volume purged 8  
 Comments on Well Recovery immediate  
 Additional Comments -  
 Samples Collected: Start 1952 Finish 2010

## IN-SITU TESTING

Date:	9/15/93	9/15/93	9/15/93				
Time:	0940	0950	1000				
Water Level	<u>4.31</u>		<u>4.34</u>				
Well Volume Purged (gal.)	<u>-</u>	<u>4</u>	<u>8</u>				
Turbidity	<u>sl.</u>	<u>mod</u>	<u>very</u>				
Odor	<u>sl.</u>	<u>mod</u>	<u>strong</u>				
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>				
pH (units)	<u>instrument erratic - unable to calibrate</u>						
Conductivity ( $\mu$ mhos)	<u>PH and conductivity</u>						
Water Temperature (°C)	<u>62.4</u>	<u>62.1</u>	<u>62.5</u>				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: Sim116w4  
PAL

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/14/93  
WELL NO. MW 11 LOCATION Site 1 Old POL  
WEATHER CONDITIONS cool AMBIENT TEMP: PAL ~~50~~ 50°F  
PERSONNEL PAL & DET  
REVIEWED BY: DET

EQUIPMENT USED: Bailer, Rope, Hand pump assembly, Filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Bailer</u>	Type Device? <u>Bailer</u>
How was the device decontaminated? <u>Alconox + DI, DI rinse</u>	How was the device decontaminated? <u>Dedicated From Purge</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>P1mw12</u>	Which well was previously sampled? _____

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>0930</u> Finished <u>0950</u>
Stickup (ft.) <u>-2'</u>	Volume purged <u>9.5</u>
Depth to bottom of well (ft.) <u>15'</u>	Comments on Well Recovery <u>Immediate</u>
Depth to water surface (ft.) <u>3.58</u>	Additional Comments _____
Length of water (ft.) <u>11.42</u>	_____
Volume of water (ft <sup>3</sup> ) <u>0.25</u>	_____
(gal.) <u>1.8</u>	_____
Amount of sediment at bottom of well (ft.) <u>-</u>	Samples Collected: Start <u>1452</u>
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>	Finish <u>1500</u>

IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>	_____	_____	_____	_____
	Time: <u>0930</u>	<u>0940</u>	<u>0950</u>	_____	_____	_____	_____
Water Level	<u>3.58</u>	<u>3.59</u>	<u>3.59</u>	_____	_____	_____	_____
Well Volume Purged (gal.)	<u>-</u>	<u>4.5</u>	<u>9.5</u>	_____	_____	_____	_____
Turbidity	<u>none</u>	<u>mod</u>	<u>mod</u>	_____	_____	_____	_____
Odor	<u>none</u>	<u>S1</u>	<u>S1</u>	_____	_____	_____	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____	_____	_____
pH (units)	<u>4.89</u>	<u>3.54</u>	<u>2.85</u>	<u>obviously is off line</u>	_____	_____	_____
Conductivity (μ mhos)	<u>unable to calibrate for conductivity</u>	_____	_____	_____	_____	_____	_____
Water Temperature (°C)	<u>61.4</u>	<u>62.1</u>	<u>61.6</u>	_____	_____	_____	_____

Notes: 1 ft. length of 4" = 0.087 m<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 m<sup>3</sup> or 0.16 gal  
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: PM12GW4

PROJECT NAME Phelps Collins AUG RT JOB NO: 931800-12 DATE: 9/13/93  
 WELL NO. MW 12 LOCATION Site 1 old POL  
 WEATHER CONDITIONS Cool, rain AMBIENT TEMP: ~52°F  
 PERSONNEL PHL  
 REVIEWED BY: DEF

EQUIPMENT USED: Bailer, rope, filter, hand pump assembly

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox + DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P8MWS

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox + DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled?

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 15  
 Depth to water surface (ft.) 3.27'  
 Length of water (ft.) 11.73  
 Volume of water (ft<sup>3</sup>) 0.258  
 (gal.) 1.9  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started: 1849 Finished 1908  
 Volume purged 10  
 Comments on Well Recovery immediate  
 Additional Comments  
 Samples Collected: Start 1430 Finish 1440

## IN-SITU TESTING

	Date: <u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>				
	Time: <u>1849</u>	<u>1858</u>	<u>1908</u>				
Water Level	<u>3.27</u>	<u>-</u>	<u>3.29</u>				
Well Volume Purged (gal.)	<u>-</u>	<u>5</u>	<u>10</u>				
Turbidity	<u>sl</u>	<u>mod</u>	<u>mod</u>				
Odor	<u>sl</u>	<u>sl</u>	<u>sl</u>				
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>				
pH (units)	<u>unable to calibrate pH and cond.</u>						
Conductivity ( $\mu$ mhos)							
Water Temperature (°C)	<u>60.2</u>	<u>60.8</u>	<u>61.4</u>				

Notes:

1 ft. length of 4"

= 0.087 ft<sup>3</sup> or 0.65 gal.

1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Turbidity choices:

clear, turbid, opaque

Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P1M13Gw4

PROJECT NAME <u>Phelps Collins AUG RT</u>		JOB NO: <u>931500-12</u>	DATE: <u>9/14/93</u>																																																																																
WELL NO. <u>MW13</u>		LOCATION <u>Site 1</u>																																																																																	
WEATHER CONDITIONS <u>cool, Raining</u>		AMBIENT TEMP: <u>~60°</u>																																																																																	
PERSONNEL <u>PHLay &amp; DF Jagan</u>																																																																																			
REVIEWED BY: <u>DEF</u>																																																																																			
EQUIPMENT USED: <u>Bailer hand pump assembly, filter</u>																																																																																			
<b>PURGING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>Alconox + DI, DI RINSE</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P1MW11</u>		<b>SAMPLING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>Alconox + DI, DI RINSE</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P1MW11</u>																																																																																	
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>15.35</u> Depth to water surface (ft.) <u>5.07</u> Length of water (ft.) <u>10.28</u> Volume of water (ft <sup>3</sup> ) <u>0.226</u> (gal.) <u>1.6</u> Amount of sediment at bottom of well (ft.) <u>-</u> LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>		<b>PURGING</b> Time started <u>1410</u> Finished <u>1422</u> Volume purged <u>8</u> Comments on Well Recovery <u>immediate</u> Additional Comments _____ Samples Collected: Start <u>1545</u> Finish <u>1600</u>																																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>9/14/93</u></th> <th><u>9/14/93</u></th> <th><u>9/14/93</u></th> <th>_____</th> <th>_____</th> <th>_____</th> <th>_____</th> </tr> <tr> <th></th> <th>Time: <u>1410</u></th> <th><u>1416</u></th> <th><u>1422</u></th> <th>_____</th> <th>_____</th> <th>_____</th> <th>_____</th> </tr> </thead> <tbody> <tr> <td>Water Level</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>-</u></td> <td><u>4</u></td> <td><u>8</u></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Turbidity</td> <td><u>SL</u></td> <td><u>SL</u></td> <td><u>mod</u></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>SL</u></td> <td><u>SL</u></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>pH (units)</td> <td colspan="7"><u>unable to calibrate PH and Conductivity</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td colspan="7"><u>8</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>66.4°</u></td> <td><u>64.4</u></td> <td><u>62.8</u></td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>	_____	_____	_____	_____		Time: <u>1410</u>	<u>1416</u>	<u>1422</u>	_____	_____	_____	_____	Water Level	_____	_____	_____	_____	_____	_____	_____	Well Volume Purged (gal.)	<u>-</u>	<u>4</u>	<u>8</u>	_____	_____	_____	_____	Turbidity	<u>SL</u>	<u>SL</u>	<u>mod</u>	_____	_____	_____	_____	Odor	<u>none</u>	<u>SL</u>	<u>SL</u>	_____	_____	_____	_____	Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____	_____	_____	pH (units)	<u>unable to calibrate PH and Conductivity</u>							Conductivity (µ mhos)	<u>8</u>							Water Temperature (°C)	<u>66.4°</u>	<u>64.4</u>	<u>62.8</u>	_____	_____	_____	_____
IN-SITU TESTING	Date: <u>9/14/93</u>	<u>9/14/93</u>	<u>9/14/93</u>	_____	_____	_____	_____																																																																												
	Time: <u>1410</u>	<u>1416</u>	<u>1422</u>	_____	_____	_____	_____																																																																												
Water Level	_____	_____	_____	_____	_____	_____	_____																																																																												
Well Volume Purged (gal.)	<u>-</u>	<u>4</u>	<u>8</u>	_____	_____	_____	_____																																																																												
Turbidity	<u>SL</u>	<u>SL</u>	<u>mod</u>	_____	_____	_____	_____																																																																												
Odor	<u>none</u>	<u>SL</u>	<u>SL</u>	_____	_____	_____	_____																																																																												
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____	_____	_____																																																																												
pH (units)	<u>unable to calibrate PH and Conductivity</u>																																																																																		
Conductivity (µ mhos)	<u>8</u>																																																																																		
Water Temperature (°C)	<u>66.4°</u>	<u>64.4</u>	<u>62.8</u>	_____	_____	_____	_____																																																																												
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91																																																																																			

# GROUNDWATER SAMPLING

Sample ID: P1m146w4

PROJECT NAME Phelps Collins ASG RT JOB NO: 931800-12 DATE: 9/15/93  
 WELL NO. mW14 LOCATION Site 1 old POL Storage area  
 WEATHER CONDITIONS cool, Raining AMBIENT TEMP: ~50°F  
 PERSONNEL PH Lay and DF Jayne  
 REVIEWED BY: DFJ

EQUIPMENT USED: Pump, Bailer, hose

## PURGING DEVICE

Type Device? Pump  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P1mW1

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconox+DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P1m13

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 32.21  
 Depth to water surface (ft.) 6.42  
 Length of water (ft.) 25.79  
 Volume of water (ft<sup>3</sup>) ~0.57  
 (gal.) ~4.12  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started: 0930 Finished 1050  
 Volume purged 22  
 Comments on Well Recovery Immediate  
 Additional Comments —  
 Samples Collected: Start 1050 Finish 1100

IN-SITU TESTING	Date: <u>9/15/93</u>	<u>9/15/93</u>	<u>9/15/93</u>	<u>9/15/93</u>			
	Time: <u>0930</u>	<u>0955</u>	<u>1025</u>	<u>1050</u>			
Water Level	<u>6.42</u>	<u>—</u>	<u>—</u>	<u>6.45</u>			
Well Volume Purged (gal.)	<u>—</u>	<u>7</u>	<u>15</u>	<u>22</u>			
Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>			
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>			
Organic Vapor (ppm)	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>			
pH (units)	<u>unable to calibrate</u>						
Conductivity (µ mhos)	<u>pH and conductivity</u>						
Water Temperature (°C)	<u>61.4</u>	<u>61.2</u>	<u>60.8</u>	<u>60.8</u>			

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91



# GROUNDWATER SAMPLING

22mw1 Gw4  
P02 July 1993 (F)  
Sample ID: P02 Gw4

PROJECT NAME <u>Phelps Collins ANG RI</u>		JOB NO: _____	DATE: <u>Aug 16, 1993</u>																																																																																
WELL NO. <u>MP2 mw1</u>	LOCATION <u>Site 2 motor pool</u>																																																																																		
WEATHER CONDITIONS <u>warm-humid, hazy</u>	AMBIENT TEMP: <u>~85°</u>																																																																																		
PERSONNEL <u>PA Lano &amp; MG. Stoker</u>																																																																																			
REVIEWED BY: <u>DET</u>																																																																																			
EQUIPMENT USED: <u>Bailer, Rope, pump assembly, filter</u>																																																																																			
PURGING DEVICE		SAMPLING DEVICE																																																																																	
Type Device? <u>Bailer</u>	Type Device? <u>Bailer</u>																																																																																		
How was the device decontaminated? <u>per logbook</u>	How was the device decontaminated? <u>per logbook</u>																																																																																		
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>																																																																																		
Which well was previously purged? <u>none</u>	Which well was previously sampled? <u>none</u>																																																																																		
INITIAL WELL VOLUME		PURGING																																																																																	
Well diameter (in.) <u>2"</u>	Time started <u>1455</u> Finished <u>1514</u>																																																																																		
Stickup (ft.) <u>2'</u>	Volume purged <u>7.5 gal</u>																																																																																		
Depth to bottom of well (ft.) <u>22'</u>	Comments on Well Recovery <u>Immediate</u>																																																																																		
Depth to water surface (ft.) <u>8.48'</u>	Additional Comments _____																																																																																		
Length of water (ft.) <u>13.52'</u>	_____																																																																																		
Volume of water (ft <sup>3</sup> ) _____	_____																																																																																		
(gal.) <u>~2.2</u>	_____																																																																																		
Amount of sediment at bottom of well (ft.) _____	Samples Collected: Start <u>1522</u>																																																																																		
LNAPL (ft.) _____ DNAPL (ft.) _____	Finish <u>1537</u>																																																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-10-93</u></th> <th><u>8-16-93</u></th> <th><u>8-16-93</u></th> <th><u>8-16-93</u></th> <th><u>8-10-93</u></th> <th>_____</th> <th>_____</th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>1455</u></td> <td><u>1502</u></td> <td><u>1505</u></td> <td><u>1514</u></td> <td><u>1537</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Water Level</td> <td><u>8.48'</u></td> <td>_____</td> <td>_____</td> <td><u>8.48</u></td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>~0-</u></td> <td><u>2.5 gal</u></td> <td><u>5</u></td> <td><u>7.5</u></td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Turbidity</td> <td><u>sl. + none</u></td> <td><u>sl.</u></td> <td><u>sl.</u></td> <td><u>sl.</u></td> <td><u>sl</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>non</u></td> <td><u>non</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>pH (units)</td> <td><u>7.79</u></td> <td><u>8.16</u></td> <td><u>7.95</u></td> <td><u>7.97</u></td> <td><u>7.96</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>346</u></td> <td><u>287</u></td> <td><u>286</u></td> <td><u>279</u></td> <td><u>258</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>70.6</u></td> <td><u>68.0</u></td> <td><u>68.1</u></td> <td><u>67.5</u></td> <td><u>67.6</u></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				IN-SITU TESTING	Date: <u>8-10-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-10-93</u>	_____	_____	Time:	<u>1455</u>	<u>1502</u>	<u>1505</u>	<u>1514</u>	<u>1537</u>	_____	_____	Water Level	<u>8.48'</u>	_____	_____	<u>8.48</u>	_____	_____	_____	Well Volume Purged (gal.)	<u>~0-</u>	<u>2.5 gal</u>	<u>5</u>	<u>7.5</u>	_____	_____	_____	Turbidity	<u>sl. + none</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>sl</u>	_____	_____	Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>non</u>	<u>non</u>	_____	_____	Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____	_____	_____	pH (units)	<u>7.79</u>	<u>8.16</u>	<u>7.95</u>	<u>7.97</u>	<u>7.96</u>	_____	_____	Conductivity (µ mhos)	<u>346</u>	<u>287</u>	<u>286</u>	<u>279</u>	<u>258</u>	_____	_____	Water Temperature (°C)	<u>70.6</u>	<u>68.0</u>	<u>68.1</u>	<u>67.5</u>	<u>67.6</u>	_____	_____
IN-SITU TESTING	Date: <u>8-10-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-16-93</u>	<u>8-10-93</u>	_____	_____																																																																												
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Well Volume Purged (gal.)	<u>~0-</u>	<u>2.5 gal</u>	<u>5</u>	<u>7.5</u>	_____	_____	_____																																																																												
Turbidity	<u>sl. + none</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>sl</u>	_____	_____																																																																												
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>non</u>	<u>non</u>	_____	_____																																																																												
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<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																																			

TETC154

# GROUNDWATER SAMPLING

Sample ID: P2mw2GW4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800</u>		DATE: <u>8-16-93</u>																																																																								
WELL NO. <u>MW2</u>		LOCATION <u>Site 2 MW2</u>																																																																										
WEATHER CONDITIONS <u>Cloudy</u>		AMBIENT TEMP: <u>~70°F</u>																																																																										
PERSONNEL <u>MARK Stoken &amp; Mike blizzard</u>																																																																												
REVIEWED BY: <u>PHL</u>																																																																												
EQUIPMENT USED: <u>pump, hose, hauler, filter</u>																																																																												
PURGING DEVICE			SAMPLING DEVICE																																																																									
Type Device? <u>pump</u>			Type Device? <u>hauler</u>																																																																									
How was the device decontaminated? <u>see log book</u>			How was the device decontaminated? <u>see log book</u>																																																																									
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>																																																																									
Which well was previously purged? <u>PSmw1</u>			Which well was previously sampled? <u>PSmw1</u>																																																																									
INITIAL WELL VOLUME			PURGING																																																																									
Well diameter (in.) <u>2"</u>			Time started <u>0845</u> Finished <u>0912</u>																																																																									
Stickup (ft.) <u>2.3'</u>			Volume purged <u>73</u>																																																																									
Depth to bottom of well (ft.) <u>18.20</u>			Comments on Well Recovery <u>immediate</u>																																																																									
Depth to water surface (ft.) <u>8.90</u>			Additional Comments <u>Collected Dup 2</u> <u>MSDS also. - Well water</u> <u>is red w/ iron.</u>																																																																									
Length of water (ft.) <u>9.30</u>																																																																												
Volume of water (ft <sup>3</sup> ) <u>1.488 gal</u>																																																																												
(gal.) <u>4 = 5.952</u>																																																																												
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>0915</u>																																																																									
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>0944</u>																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-16-93</u></th> <th><u>8-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> <th><u>08-16-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>0845</u></td> <td><u>08:52</u></td> <td><u>08:59</u></td> <td><u>09:07</u></td> <td><u>09:12</u></td> <td><u>09:15</u></td> </tr> <tr> <td>Water Level</td> <td><u>8.90</u></td> <td></td> <td></td> <td></td> <td></td> <td><u>8.95</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>8</u></td> <td><u>2</u></td> <td><u>4</u></td> <td><u>6</u></td> <td><u>7</u></td> <td></td> </tr> <tr> <td>Turbidity</td> <td><u>51</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> </tr> <tr> <td>Odor</td> <td><u>-0-</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> <td><u>None</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> <td><u>-0-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>7.68</u></td> <td><u>6.98</u></td> <td><u>7.42</u></td> <td><u>7.29</u></td> <td><u>7.36</u></td> <td><u>7.41</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>192</u></td> <td><u>190</u></td> <td><u>216</u></td> <td><u>246</u></td> <td><u>238</u></td> <td><u>241</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>63.2</u></td> <td><u>60.0</u></td> <td><u>59.2</u></td> <td><u>59.3</u></td> <td><u>59.1</u></td> <td><u>59.3</u></td> </tr> </tbody> </table>							IN-SITU TESTING	Date: <u>8-16-93</u>	<u>8-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	Time:	<u>0845</u>	<u>08:52</u>	<u>08:59</u>	<u>09:07</u>	<u>09:12</u>	<u>09:15</u>	Water Level	<u>8.90</u>					<u>8.95</u>	Well Volume Purged (gal.)	<u>8</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		Turbidity	<u>51</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	Odor	<u>-0-</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	pH (units)	<u>7.68</u>	<u>6.98</u>	<u>7.42</u>	<u>7.29</u>	<u>7.36</u>	<u>7.41</u>	Conductivity (µ mhos)	<u>192</u>	<u>190</u>	<u>216</u>	<u>246</u>	<u>238</u>	<u>241</u>	Water Temperature (°C)	<u>63.2</u>	<u>60.0</u>	<u>59.2</u>	<u>59.3</u>	<u>59.1</u>	<u>59.3</u>
IN-SITU TESTING	Date: <u>8-16-93</u>	<u>8-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>	<u>08-16-93</u>																																																																						
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Water Level	<u>8.90</u>					<u>8.95</u>																																																																						
Well Volume Purged (gal.)	<u>8</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>																																																																							
Turbidity	<u>51</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>																																																																						
Odor	<u>-0-</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>																																																																						
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>																																																																						
pH (units)	<u>7.68</u>	<u>6.98</u>	<u>7.42</u>	<u>7.29</u>	<u>7.36</u>	<u>7.41</u>																																																																						
Conductivity (µ mhos)	<u>192</u>	<u>190</u>	<u>216</u>	<u>246</u>	<u>238</u>	<u>241</u>																																																																						
Water Temperature (°C)	<u>63.2</u>	<u>60.0</u>	<u>59.2</u>	<u>59.3</u>	<u>59.1</u>	<u>59.3</u>																																																																						
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																												

TETC134

# GROUNDWATER SAMPLING

Sample ID: P2mw36u4

PROJECT NAME Phelps Collins RI JOB NO: 931800 DATE: 8-16-93  
 WELL NO. mw3 LOCATION Site 2  
 WEATHER CONDITIONS Cloudy AMBIENT TEMP: 27.2°F  
 PERSONNEL Mark Stokes & Mike Blizzard  
 REVIEWED BY: PLC

EQUIPMENT USED: pump, hose, bailer, filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>pump</u>	Type Device? <u>bailer</u>
How was the device decontaminated? <u>see log book</u>	How was the device decontaminated? <u>see log book</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>2mw2</u>	Which well was previously sampled? <u>2mw2</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>10:20</u> Finished <u>11:00</u>
Stickup (ft.) <u>2.2'</u>	Volume purged <u>10 g</u>
Depth to bottom of well (ft.) <u>21.95</u>	Comments on Well Recovery _____
Depth to water surface (ft.) <u>8.45</u>	Additional Comments _____
Length of water (ft.) <u>13.50</u>	
Volume of water (ft <sup>3</sup> ) <u>2.16</u>	
(gal.) <u>8.64</u>	
Amount of sediment at bottom of well (ft.) <u>-</u>	Sample Collected: Start <u>11:05</u>
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>	Finish <u>11:17</u>

IN-SITU TESTING	Date: <u>08-16-93</u>	<u>08/16/93</u>	<u>8/16/93</u>	<u>8/16/93</u>	<u>8/16/93</u>	<u>08-16-93</u>
Time:	<u>10:20</u>	<u>10:30</u>	<u>10:40</u>	<u>10:50</u>	<u>10:55</u>	<u>11:05</u>
Water Level	<u>8.45</u>					<u>8.49</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>
Turbidity	<u>31</u>					
Odor	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>7.37</u>	<u>7.47</u>	<u>7.46</u>	<u>7.39</u>	<u>7.45</u>	<u>7.44</u>
Conductivity (µ mhos)	<u>39</u>	<u>39</u>	<u>1.34</u>	<u>1.38</u>	<u>1.76</u>	<u>1.72</u>
Water Temperature (°C)	<u>61.7</u>	<u>61.7</u>	<u>62.3</u>	<u>60.8</u>	<u>59.9</u>	<u>59.3</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P2mw46w4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800</u>		DATE: <u>8-12-93</u>																																																																																	
WELL NO. <u>mw4</u>		LOCATION <u>Motor Pool Site 2</u>																																																																																			
WEATHER CONDITIONS <u>Warm, Sunny</u>		AMBIENT TEMP: <u>~68°F</u>																																																																																			
PERSONNEL <u>PH Lay, ME Stoker</u>																																																																																					
REVIEWED BY: <u>DFT</u>																																																																																					
EQUIPMENT USED: <u>Bailer, rope, hand pump assembly, filter</u>																																																																																					
PURGING DEVICE Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P06mw1</u>			SAMPLING DEVICE Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P06mw1</u>																																																																																		
INITIAL WELL VOLUME Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>22.2' BTOC</u> <u>PHC 8-12-93</u> Depth to water surface (ft.) <u>8.78' + 4.42' BTOC</u> <u>13.42' + 4.42' PHC</u> Length of water (ft.) <u>8.273</u> Volume of water (ft <sup>3</sup> ) <u>~0.3</u> <u>~2.2' PHC</u> <u>~2.35' 8-12-93</u> (gal.) Amount of sediment at bottom of well (ft.) LNAPL (ft.) DNAPL (ft.)			PURGING Time started <u>0730</u> Finished <u>0951</u> Volume purged <u>~11 gal/s</u> Comments on Well Recovery <u>immediate</u> Additional Comments Samples Collected: Start <u>PHC 8-12-93</u> <u>6928 1028</u> Finish <u>1044</u>																																																																																		
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Turbidity	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>																																																																														
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<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque</p> <p>Revision Date: 2-8-91</p>																																																																																					

TETC-154

# GROUNDWATER SAMPLING

Sample ID: P2mw46w4 *Re-survey*

PROJECT NAME Phelps Collins RF JOB NO: 931800 DATE: 8-16-93  
 WELL NO. mw4 LOCATION Site 2  
 WEATHER CONDITIONS cloudy AMBIENT TEMP: ~75°F  
 PERSONNEL Mark Stotter & Mike Blizzard  
 REVIEWED BY: PH-Lag

EQUIPMENT USED: peristaltic pump, teflon boiler, and metals filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Pump</u>	Type Device? <u>boiler</u>
How was the device decontaminated? <u>see log book</u>	How was the device decontaminated? <u>see log</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>2mw3</u>	Which well was previously sampled? <u>2mw3</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1415</u> Finished <u>1455</u>
Stickup (ft.) <u>22</u>	Volume purged <u>8.62</u>
Depth to bottom of well (ft.) <u>22.33</u>	Comments on Well Recovery <u>Recovery</u>
Depth to water surface (ft.) <u>8.85</u>	<u>Very good water at 8.9' after purge</u>
Length of water (ft.) <u>13.48</u>	Additional Comments _____
Volume of water (ft <sup>3</sup> ) <u>2.15</u>	
(gal.) <u>2.15 gal</u>	
Amount of sediment at bottom of well (ft.) _____	Samples Collected: Start <u>1500</u>
LNAPL (ft.) _____ DNAPL (ft.) _____	Finish <u>2510</u>

IN-SITU TESTING	Date: <u>8-16</u>					
	Time: <u>1415</u>	<u>1420</u>	<u>1430</u>	<u>1440</u>	<u>1450</u>	
Water Level						
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	
Turbidity						
Odor	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>		
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>		
pH (units)	<u>8.41</u>	<u>8.34</u>	<u>8.11</u>	<u>8.2</u>	<u>8.11</u>	
Conductivity (µ mhos)	<u>222</u>	<u>278</u>	<u>271</u>	<u>269</u>	<u>268</u>	
Water Temperature (°C)	<u>65.5</u>	<u>60.1</u>	<u>60</u>	<u>60</u>	<u>60.1</u>	

Notes: 1 ft. length of 4" = 0.087 m<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 m<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91 -

ETC154

# GROUNDWATER SAMPLING

Sample ID: P2mws6w4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800</u>		DATE: <u>8-12-93</u>																																																																																	
WELL NO. <u>MWS</u>		LOCATION <u>Motor Pool Site 2</u>																																																																																			
WEATHER CONDITIONS <u>Warm, sunny</u>		AMBIENT TEMP: <u>68°F</u>																																																																																			
PERSONNEL <u>PH Lay M &amp; stoker</u>																																																																																					
REVIEWED BY: <u>DEF</u>																																																																																					
EQUIPMENT USED: <u>Pump, hose, Bailer, pump assembly w/ Filter</u>																																																																																					
PURGING DEVICE			SAMPLING DEVICE																																																																																		
Type Device? <u>Pump (650 pump)</u>			Type Device? <u>Bailer</u>																																																																																		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																																		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>																																																																																		
Which well was previously purged? <u>Polemw1</u>			Which well was previously sampled? <u>Polemw1</u>																																																																																		
INITIAL WELL VOLUME			PURGING																																																																																		
Well diameter (in.) <u>2"</u>			Time started <u>6:17</u> Finished <u>11:5</u>																																																																																		
Stickup (ft.) <u>-2'</u>			Volume purged <u>27 gal</u>																																																																																		
Depth to bottom of well (ft.) <u>57' BTOC</u>			Comments on Well Recovery <u>Immediate</u>																																																																																		
Depth to water surface (ft.) <u>8.63' BTOC</u>			Additional Comments <u>-</u>																																																																																		
Length of water (ft.) <u>48.37</u>			Samples Collected: Start <u>11:20</u>																																																																																		
Volume of water (ft <sup>3</sup> ) <u>1.064</u>			Finish <u>11:59</u>																																																																																		
(gal.) <u>-7.75</u>																																																																																					
Amount of sediment at bottom of well (ft.)																																																																																					
LNAPL (ft.)			DNAPL (ft.)																																																																																		
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IN-SITU TESTING	Date: <u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>																																																																														
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Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>																																																																														
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pH (units)	<u>8.40</u>	<u>8.26</u>	<u>8.27</u>	<u>8.24</u>	<u>8.18</u>	<u>8.11</u>	<u>8.13</u>																																																																														
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Water Temperature (°C)	<u>61.2</u>	<u>57.2</u>	<u>58.1</u>	<u>60.8</u>	<u>61.0</u>	<u>60.2</u>	<u>61.2</u>																																																																														
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																																					

TETC134

# GROUNDWATER SAMPLING

Sample ID: P2MW5GW4 *Resample*

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93  
 WELL NO. NW5 LOCATION Site 2  
 WEATHER CONDITIONS cloudy, breezy, humid AMBIENT TEMP: 70 °F  
 PERSONNEL J. Smith M. Stoken  
 REVIEWED BY: PHLg

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Peristaltic Pump</u>	Type Device? <u>for metals → peristaltic pump</u> <u>teflon bailer for VOCs, SVOCs, TPH</u>
How was the device decontaminated? <u>see logbook</u>	How was the device decontaminated? <u>DI water → methanol; air dry</u>
How was the line decontaminated? <u>see logbook</u>	How was the line decontaminated? <u>disposable new nylon cord used each time</u>
Which well was previously purged? <u>Site 6 MW6</u>	Which well was previously sampled? <u>P6 MW6 GW4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1344</u> Finished <u>1420</u>
Stickup (ft.) <u>~2'</u>	Volume purged <u>25</u> gallons
Depth to bottom of well (ft.) <u>BTC</u> <u>~57</u>	Comments on Well Recovery _____
Depth to water surface (ft.) <u>BTC</u> <u>8.25'</u>	Additional Comments _____
Length of water (ft.) <u>48.75'</u>	<u>Sample for VOCs only due to</u> <u>Chompuckem's missed holding time</u>
Volume of water (ft <sup>3</sup> ) <u>1.1</u>	Sample Collected: Start <u>1420</u>
(gal.) <u>7.8</u>	1430 sample time Finish <u>1430</u>
Amount of sediment at bottom of well (ft.) <u>NM</u>	
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	

23.4  
gallon  
minimum

IN-SITU TESTING	Date: <u>8/30/93</u>					
Time:	<u>1344</u>	<u>1350</u>	<u>1355</u>	<u>1408</u>	<u>1414</u>	<u>1420</u>
Water Level ft BTC	<u>8.24</u>	<u>8.27</u>	<u>8.28</u>	<u>8.31</u>	<u>8.30</u>	<u>8.30</u>
Well Volume Purged (gal.)	<u>0</u>	<u>15</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>
Turbidity	<u>clear</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>*</u>					
Conductivity (μ mhos)	<u>4560</u>	<u>780</u>	<u>869</u>	<u>1097</u>	<u>1097</u>	<u>1116</u>
Water Temperature (°F)	<u>63.9</u>	<u>59.2</u>	<u>59.5</u>	<u>60.0</u>	<u>64.3</u>	<u>54.5</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

BTC = Below Top of Outer Steel Casing  
 (Bottom of the (Outer Steel) Casing)

\* pH meter expired

G-43

\* conductivity meter may be broken

# GROUNDWATER SAMPLING

Sample ID: P2mw66w4

PROJECT NAME <u>Phelps Collins ANG RE</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/9/93</u>																																																																																		
WELL NO. <u>mw6</u>		LOCATION <u>Site 2 motor pool</u>																																																																																				
WEATHER CONDITIONS <u>Cool, rainy</u>		AMBIENT TEMP: <u>~60°</u>																																																																																				
PERSONNEL <u>PA Lay &amp; RF Nocton</u>																																																																																						
REVIEWED BY: <u>DET</u>																																																																																						
EQUIPMENT USED: <u>Pump, hose, Bailer, rope</u>																																																																																						
PURGING DEVICE			SAMPLING DEVICE																																																																																			
Type Device? <u>Peristaltic pump</u>			Type Device? <u>Bailer</u>																																																																																			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																																			
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>dedicated</u>																																																																																			
Which well was previously purged? <u>P6mw9</u>			Which well was previously sampled? <u>P6mw9</u>																																																																																			
INITIAL WELL VOLUME			PURGING																																																																																			
Well diameter (in.) <u>2"</u>			Time started <u>0810</u> Finished <u>0912</u>																																																																																			
Stickup (ft.) <u>-0.3</u>			Volume purged <u>15 galls.</u>																																																																																			
Depth to bottom of well (ft.) <u>26.62</u>			Comments on Well Recovery <u>Immediate</u>																																																																																			
Depth to water surface (ft.) <u>7.93</u>			Additional Comments _____																																																																																			
Length of water (ft.) <u>18.69</u>			_____																																																																																			
Volume of water (ft <sup>3</sup> ) _____			_____																																																																																			
(gal.) <u>~2.99 or 3</u>			_____																																																																																			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>0925</u>																																																																																			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>0935</u>																																																																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>0810</u></td> <td><u>0820</u></td> <td><u>0830</u></td> <td><u>0842</u></td> <td><u>0858</u></td> <td><u>0912</u></td> <td><u>0925</u></td> </tr> <tr> <td>Water Level</td> <td><u>7.93</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>7.96</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>-</u></td> <td><u>3</u></td> <td><u>6</u></td> <td><u>9</u></td> <td><u>12</u></td> <td><u>15</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>none</u></td> <td><u>-</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>SL</u></td> <td><u>mod</u></td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>none</u></td> <td><u>SL</u></td> <td><u>SL</u></td> <td><u>mod.</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>0</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>8.73</u></td> <td><u>7.91</u></td> <td><u>7.94</u></td> <td><u>7.68</u></td> <td><u>7.88</u></td> <td><u>7.68</u></td> <td><u>7.76</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>318</u></td> <td><u>332</u></td> <td><u>319</u></td> <td><u>326</u></td> <td><u>930</u></td> <td><u>921</u></td> <td><u>889</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>52.3</u></td> <td><u>55.7</u></td> <td><u>55.3</u></td> <td><u>55.2</u></td> <td><u>55.1</u></td> <td><u>55.5</u></td> <td><u>55.4</u></td> </tr> </tbody> </table>							IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	Time:	<u>0810</u>	<u>0820</u>	<u>0830</u>	<u>0842</u>	<u>0858</u>	<u>0912</u>	<u>0925</u>	Water Level	<u>7.93</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>7.96</u>	Well Volume Purged (gal.)	<u>-</u>	<u>3</u>	<u>6</u>	<u>9</u>	<u>12</u>	<u>15</u>	<u>-</u>	Turbidity	<u>none</u>	<u>-</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	<u>mod</u>	Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	<u>SL</u>	<u>mod.</u>	Organic Vapor (ppm)	<u>0</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	pH (units)	<u>8.73</u>	<u>7.91</u>	<u>7.94</u>	<u>7.68</u>	<u>7.88</u>	<u>7.68</u>	<u>7.76</u>	Conductivity (µ mhos)	<u>318</u>	<u>332</u>	<u>319</u>	<u>326</u>	<u>930</u>	<u>921</u>	<u>889</u>	Water Temperature (°C)	<u>52.3</u>	<u>55.7</u>	<u>55.3</u>	<u>55.2</u>	<u>55.1</u>	<u>55.5</u>	<u>55.4</u>
IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>																																																																															
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Turbidity	<u>none</u>	<u>-</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	<u>mod</u>																																																																															
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	<u>SL</u>	<u>mod.</u>																																																																															
Organic Vapor (ppm)	<u>0</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>																																																																															
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<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91</p>																																																																																						

TETC154



# GROUNDWATER SAMPLING

Sample ID: P2mw7Gws4

PROJECT NAME _____		JOB NO: _____		DATE: <u>9/9/93</u>																																																																								
WELL NO. <u>mw7</u>		LOCATION <u>Motoe Pool Site 2</u>																																																																										
WEATHER CONDITIONS <u>cool, Rainy</u>		AMBIENT TEMP: <u>~62°F</u>																																																																										
PERSONNEL <u>JHLay and BFNorton</u>																																																																												
REVIEWED BY: <u>DEJ</u>																																																																												
EQUIPMENT USED: _____																																																																												
PURGING DEVICE			SAMPLING DEVICE																																																																									
Type Device? <u>Pump</u>			Type Device? <u>Bailer</u>																																																																									
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																									
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>dedicated</u>																																																																									
Which well was previously purged? <u>P2mw6</u>			Which well was previously sampled? <u>P2mw6</u>																																																																									
INITIAL WELL VOLUME			PURGING																																																																									
Well diameter (in.) <u>2"</u>			Time started <u>1338</u> Finished <u>1410</u>																																																																									
Stickup (ft.) <u>-0.3</u>			Volume purged <u>7</u>																																																																									
Depth to bottom of well (ft.) <u>14.8</u>			Comments on Well Recovery <u>Immediate</u>																																																																									
Depth to water surface (ft.) <u>6.64</u>			Additional Comments _____																																																																									
Length of water (ft.) <u>8.16</u>			_____																																																																									
Volume of water (ft <sup>3</sup> ) <u>~0.18</u>			_____																																																																									
(gal.) <u>~1.3</u>			_____																																																																									
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1412</u>																																																																									
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1425</u>																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> <th><u>9/9/93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>1338</u></td> <td><u>1344</u></td> <td><u>1351</u></td> <td><u>1358</u></td> <td><u>1401</u></td> <td><u>1425</u></td> </tr> <tr> <td>Water Level</td> <td><u>6.64</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>6.68</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>initial</u></td> <td><u>1.5</u></td> <td><u>3</u></td> <td><u>4.5</u></td> <td><u>6</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>mod</u></td> <td><u>mod.</u></td> <td><u>sl.</u></td> <td><u>sl</u></td> <td><u>none</u></td> <td><u>mod</u></td> </tr> <tr> <td>Odor</td> <td><u>sl.</u></td> <td><u>mod</u></td> <td><u>sl.</u></td> <td><u>sl.</u></td> <td><u>sl.</u></td> <td><u>mod.</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>8.16</u></td> <td><u>8.05</u></td> <td><u>8.03</u></td> <td><u>8.07</u></td> <td><u>7.89</u></td> <td><u>7.88</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>548</u></td> <td><u>524</u></td> <td><u>506</u></td> <td><u>507</u></td> <td><u>478</u></td> <td><u>479</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>62.1</u></td> <td><u>63.4</u></td> <td><u>63.5</u></td> <td><u>63.6</u></td> <td><u>63.7</u></td> <td><u>63.8</u></td> </tr> </tbody> </table>							IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	Time:	<u>1338</u>	<u>1344</u>	<u>1351</u>	<u>1358</u>	<u>1401</u>	<u>1425</u>	Water Level	<u>6.64</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>6.68</u>	Well Volume Purged (gal.)	<u>initial</u>	<u>1.5</u>	<u>3</u>	<u>4.5</u>	<u>6</u>	<u>-</u>	Turbidity	<u>mod</u>	<u>mod.</u>	<u>sl.</u>	<u>sl</u>	<u>none</u>	<u>mod</u>	Odor	<u>sl.</u>	<u>mod</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>mod.</u>	Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	pH (units)	<u>8.16</u>	<u>8.05</u>	<u>8.03</u>	<u>8.07</u>	<u>7.89</u>	<u>7.88</u>	Conductivity (µ mhos)	<u>548</u>	<u>524</u>	<u>506</u>	<u>507</u>	<u>478</u>	<u>479</u>	Water Temperature (°C)	<u>62.1</u>	<u>63.4</u>	<u>63.5</u>	<u>63.6</u>	<u>63.7</u>	<u>63.8</u>
IN-SITU TESTING	Date: <u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>	<u>9/9/93</u>																																																																						
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Well Volume Purged (gal.)	<u>initial</u>	<u>1.5</u>	<u>3</u>	<u>4.5</u>	<u>6</u>	<u>-</u>																																																																						
Turbidity	<u>mod</u>	<u>mod.</u>	<u>sl.</u>	<u>sl</u>	<u>none</u>	<u>mod</u>																																																																						
Odor	<u>sl.</u>	<u>mod</u>	<u>sl.</u>	<u>sl.</u>	<u>sl.</u>	<u>mod.</u>																																																																						
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>																																																																						
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Conductivity (µ mhos)	<u>548</u>	<u>524</u>	<u>506</u>	<u>507</u>	<u>478</u>	<u>479</u>																																																																						
Water Temperature (°C)	<u>62.1</u>	<u>63.4</u>	<u>63.5</u>	<u>63.6</u>	<u>63.7</u>	<u>63.8</u>																																																																						
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																												

TETC154

# GROUNDWATER SAMPLING

Sample ID: P3MW6GW4

PROJECT NAME Phelps Collins #1 G JOB NO: 931800-12 DATE: 9/10/93  
 WELL NO. MW6 LOCATION Site 3  
 WEATHER CONDITIONS Cool, Raining AMBIENT TEMP: ~58°F  
 PERSONNEL Phleg and BFN Ooster  
 REVIEWED BY: DEJaye

EQUIPMENT USED: Bailer, Rope, pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? Simms4

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? Simms

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~0.3  
 Depth to bottom of well (ft.) 27.8'  
 Depth to water surface (ft.) 14.77'  
 Length of water (ft.) 13.03'  
 Volume of water (ft<sup>3</sup>) 0.2867  
 (gal.) ~2.1  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1345 Finished 1407  
 Volume purged 10 gals  
 Comments on Well Recovery moderate to immediate  
 Additional Comments —  
 Samples Collected: Start 1555 Finish 1620

IN-SITU TESTING	Date:	9/10/93	9/10/93	9/10/93	9/10/93	9/10/93		
	Time:	1345	1351	1359	1403	1407		
Water Level		14.77						
Well Volume Purged (gal.)		initial	2.5	5	7.5	10		
Turbidity		SI	mod	mod	mod	very		
Odor		SI	SI	mod	mod	mod		
Organic Vapor (ppm)		—	—	—	—	—		
pH (units)		7.89	7.94	7.78	7.88	7.66		
Conductivity (µ mhos)		952	991	522	506	928		
Water Temperature (°C)		55.7	56.2	55.4	52.9	53.1		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.18 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P3mw7Gw4

PROJECT NAME <u>Phelps Collins ANG RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>7/15/93</u>		
WELL NO. <u>MW7</u>		LOCATION <u>Site 3</u>				
WEATHER CONDITIONS <u>Sunny Windy</u>		AMBIENT TEMP: <u>~65°F</u>				
PERSONNEL <u>PHL and BCN</u>						
REVIEWED BY: <u>DF Tague</u>						
EQUIPMENT USED: <u>Pump (peristaltic) hose, Barker, rope</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Pump</u>			Type Device? <u>Barker</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P6mw6Gw4</u> <u>Re-purged</u>			Which well was previously sampled? <u>P6mw6Gw4</u> <u>Re-sampled</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0925</u> Finished <u>1010</u>			
Stickup (ft.) <u>-0.3</u>			Volume purged <u>6.5 gals</u>			
Depth to bottom of well (ft.) <u>22' BTOC at mark</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>14.5'</u>			Additional Comments _____			
Length of water (ft.) <u>7.5'</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.165</u>			_____			
(gal.) <u>1.2</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1005</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1025</u>			
IN-SITU TESTING						
Date:	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	_____
Time:	<u>0925</u>	<u>0940</u>	<u>0953</u>	<u>1008</u>	<u>1025</u>	_____
Water Level	<u>14.50</u>	<u>14.52</u>	_____	<u>14.53</u>	<u>14.52</u>	_____
Well Volume Purged (gal.)	<u>initial</u>	<u>2 gal</u>	<u>4</u>	<u>6</u>	<u>-</u>	_____
Turbidity	<u>SL</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>	_____
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____
pH (units)	<u>8.07</u>	<u>8.34</u>	<u>8.46</u>	<u>8.39</u>	<u>8.25</u>	_____
Conductivity (µ mhos)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____
Water Temperature (°C)	<u>16.7</u>	<u>16.5</u>	<u>16.3</u>	<u>16.4</u>	<u>16.7</u>	_____
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>						

TETC154

# GROUNDWATER SAMPLING

Sample ID: P3mw16w4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-15-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>County Garage Site 3</u>				
WEATHER CONDITIONS <u>cool, cloudy</u>		AMBIENT TEMP: <u>65°F</u>				
PERSONNEL <u>Philly ME stoker.</u>						
REVIEWED BY: <u>DPS</u>						
EQUIPMENT USED: <u>Pump/hose, bailer, rope</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Pump</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>D4mw1</u>			Which well was previously sampled? <u>P4 mw1</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0932</u> Finished <u>1015</u> <u>DPS</u> <u>PHC 8-15-93</u>			
Stickup (ft.) <u>-2'</u>			Volume purged <u>9 gallons</u>			
Depth to bottom of well (ft.) <u>22.2</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>11.3' BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>PHC 8-15-93 22.2 - 10.9' = 11.3'</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>PHC 8-15-93 10.9' ~ 0.24 ft<sup>3</sup></u>			_____			
(gal.) <u>~ 1.75'</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1014</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1020</u>			
IN-SITU TESTING						
Date:	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>
Time:	<u>0933</u>	<u>0943</u>	<u>0953</u>	<u>1003</u>	<u>1013</u>	<u>1030</u>
Water Level	<u>11.3'</u>					<u>11.3'</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>-</u>
Turbidity	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>-</u>
Organic Vapor (ppm)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>-</u>
pH (units)	<u>7.85</u>	<u>8.17</u>	<u>8.13</u>	<u>8.20</u>	<u>8.18</u>	<u>8.20</u>
Conductivity (µ mhos)	<u>283</u>	<u>262</u>	<u>260</u>	<u>258</u>	<u>241</u>	<u>263</u>
Water Temperature (°C)	<u>64.2</u>	<u>61.5</u>	<u>61.2</u>	<u>60.8</u>	<u>60.6</u>	<u>61.2</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal.						
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

Sample ID: P03MW2GW4

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW2 LOCATION Site 3  
 WEATHER CONDITIONS Hot, sunny, clear AMBIENT TEMP: 95°F  
 PERSONNEL Play - J. Smith  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE Type Device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>See logbook</u> Which well was previously purged? <u>Site 3 MW3</u>	SAMPLING DEVICE <u>metals → peristaltic pump</u> Type Device? <u>teflon bailer for VOXS, SVOXs, TPH</u> How was the device decontaminated? <u>DI water → methanol; air dry</u> How was the line decontaminated? <u>disposable new nylon cord used each time</u> Which well was previously sampled? <u>P03MW3GW4</u>
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INITIAL WELL VOLUME Well diameter (in.) <u>2"</u> Stickup (ft.) <u>22'</u> Depth to bottom of well (ft.) <u>BTOC 32.21</u> Depth to water surface (ft.) <u>BTOC 18.75</u> Length of water (ft.) <u>13.46</u> Volume of water (ft <sup>3</sup> ) <u>0.3</u> (gal.) <u>2.2</u> Amount of sediment at bottom of well (ft.) <u>~0.1' NM</u> LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	PURGING Time started <u>1504</u> Finished <u>1538</u> Volume purged <u>gallons</u> Comments on Well Recovery <u>none</u> Additional Comments <u>well had some fibers (from rope?) in it.</u> Samples Collected: Start <u>1539</u> Finish <u>1555</u>
--	---

2.2 gal  
6.6 gal  
minimum  
purge

IN-SITU TESTING	Date: <u>8/25/93</u>						
	Time: <u>1504</u>	<u>1515</u>	<u>1523</u>	<u>1532</u>	<u>1538</u>	<u>1555</u>	
Water Level ft BTOC	<u>18.77</u>	<u>18.77</u>	<u>18.77</u>	<u>18.78</u>	<u>18.76</u>	<u>18.55</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	<u>7</u>	<u>8</u>	<u>8-25-93</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>BL</u>	
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.67</u>	<u>7.55</u>	<u>7.50</u>	<u>7.52</u>	<u>7.85</u>	<u>7.85</u>	
Conductivity (µ mhos)	<u>532</u>	<u>507</u>	<u>5.20</u>	<u>4.88</u>	<u>559</u>	<u>559</u>	
Water Temperature (°F)	<u>76.9</u>	<u>63.8</u>	<u>62.0</u>	<u>61.4</u>	<u>63.9</u>	<u>63.9</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-49

BTOC = Below Top of (outer steel) casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P03 MW3 GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW3 LOCATION Sik 3  
 WEATHER CONDITIONS Sunny, clear, sl. breezy AMBIENT TEMP: ~75°F  
 PERSONNEL J. Smith & P. Lay  
 REVIEWED BY: DFS

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? Sik 5 MW2

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water + allonox → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P05 MW2 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTC 24.95  
 Depth to water surface (ft.) BTC 14.08  
 Length of water (ft.) 10.87  
 Volume of water (ft<sup>3</sup>) 0.24  
 (gal.) 1.7  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0951 Finished 1014  
 Volume purged gallons  
 Comments on Well Recovery None  
 Additional Comments None  
 Samples Collected: Start 1014  
 Finish 1030

IN-SITU TESTING	Date: <u>8/25/93</u>					
	Time: <u>0951</u>	<u>1000</u>	<u>10:06</u>	<u>1013</u>	<u>1021</u>	<u>1030</u>
Water Level ft BTC	<u>14.12</u>	<u>14.12</u>	<u>14.12</u>	<u>14.12</u>	<u>14.01</u>	<u>14.01</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>4.5</u>	<u>6.0</u>	<u>6.5</u>	<u>6.5</u>
Turbidity	<u>sl. cloudy</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>None</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.46</u>	<u>7.60</u>	<u>7.63</u>	<u>7.65</u>	<u>7.82</u>	<u>7.82</u>
Conductivity (µ mhos)	<u>472</u>	<u>425</u>	<u>420</u>	<u>430</u>	<u>492</u>	<u>492</u>
Water Temperature (°F)	<u>64.6</u>	<u>59.0</u>	<u>57.9</u>	<u>56.7</u>	<u>60.3</u>	<u>60.3</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque  
 Revision Date: 2-8-91

TETC134

NM = Not Measured

G-50

BTC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P03MW4GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/25/93  
 WELL NO. MW4 LOCATION Site 3  
 WEATHER CONDITIONS Sunny, clear, sl. breezy AMBIENT TEMP: ~80°F  
 PERSONNEL J. Smith, P. Lays  
 REVIEWED BY: DF Jager

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE Type Device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>see logbook</u> How was the line decontaminated? <u>see logbook</u> Which well was previously purged? <u>Site 3 MW3</u>	SAMPLING DEVICE <u>for metals → peristaltic pump</u> Type Device? <u>stainless steel teflon bailer for VOCs, SVOCs, TPH</u> How was the device decontaminated? <u>see logbook</u> How was the line decontaminated? <u>disposable new nylon cord used each time</u> Which well was previously sampled? <u>P03 MW3 GW4</u>
---	--

INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) 22'  
 Depth to bottom of well (ft.) BTOC 32.00  
 Depth to water surface (ft.) BTOC 18.32  
 Length of water (ft.) 13.68  
 Volume of water (ft<sup>3</sup>) 0.37  
 (gal.) 2.7  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING

Time started 1049 Finished 1119  
 Volume purged ~8 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1120  
 Sample time: Finish 1140

IN-SITU TESTING	Date: <u>8/25/93</u>						
	Time: <u>1049</u>	<u>1101</u>	<u>1108</u>	<u>1119</u>	<u>1124</u>	<u>1135</u>	
Water Level # <u>BTOC</u>	<u>18.37</u>	<u>18.35</u>	<u>18.35</u>	<u>18.38</u>	<u>18.32</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>			
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>cloudy</u>	<u>cloudy</u>	
Odor	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.82</u>	<u>7.77</u>	<u>7.73</u>	<u>7.75</u>	<u>7.78</u>	<u>7.78</u>	
Conductivity (µ mhos)	<u>6.93</u>	<u>4.74</u>	<u>4.63</u>	<u>5.38</u>	<u>6.20</u>	<u>6.20</u>	
Water Temperature (°F) <u>8/25/93</u>	<u>72.5</u>	<u>64.1</u>	<u>63.2</u>	<u>64.3</u>	<u>67.6</u>	<u>67.6</u>	
Notes:	1 ft. length of 4"	= 0.087 ft <sup>3</sup> or 0.65 gal		1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal		Revision Date: 2-8-91	
Turbidity choices:	clear, turbid, opaque						

2.7  
x 3  
8.1 gal  
in 3 well  
Vols.  
  
2.2  
3  
6.6 gal  
in 3 well  
Vols.

TETC134

NM = Not Measured

G-51

BTOC = Below Top of (Outer steel) Casing

after sampling

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: ~~P3MWS~~ P3MW9GW4

and blind dupe  
P3MW9GW4  
(1200)

(double  
volume  
for MSM  
11:30

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/26/93  
WELL NO. MWS LOCATION Sik 3  
WEATHER CONDITIONS sunny, humid, calm AMBIENT TEMP: ~80 °F  
PERSONNEL P. Lay + J. Smith  
REVIEWED BY: DFS

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
Type Device? Peristaltic Pump  
How was the device decontaminated? see logbook  
How was the line decontaminated? see logbook  
Which well was previously purged? Sik 3 MW2

SAMPLING DEVICE metals → peristaltic pump  
Type Device? teflon bailer for VOCs, SVOCs, TPH  
How was the device decontaminated? DI water → methanol; air dry  
How was the line decontaminated? disposable new nylon cord used each time  
Which well was previously sampled?

INITIAL WELL VOLUME  
Well diameter (in.) 2"  
Stickup (ft.) ~2'  
Depth to bottom of well (ft.) BTOC 57.54'  
Depth to water surface (ft.) BTOC 18.50'  
Length of water (ft.) 39.04'  
Volume of water (ft<sup>3</sup>) 0.86  
(gal.) 6.2  
Amount of sediment at bottom of well (ft.) NM  
LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
Time started 0942 Finished 1110  
Volume purged ~22 gallons  
Comments on Well Recovery none  
Additional Comments none  
Samples Collected: Start 1111  
1130 time sample / MSMSD Finish 1138  
1200 time end dupe

IN-SITU TESTING	Date: <u>8/24/93</u>						
	Time: <u>0943</u>	<u>1002</u>	<u>1021</u>	<u>1040</u>	<u>1101</u>	<u>1112</u>	<u>1138</u>
Water Level if BTOC	<u>1857</u>	<u>1858</u>	<u>1858</u>	<u>1858</u>	<u>1857</u>	<u>1847</u>	<u>NM</u>
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>		<u>~22</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>gushing</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>gushing</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>gushing</u>	<u>NM</u>
pH (units)	<u>7.17</u>	<u>7.92</u>	<u>8.18</u>	<u>8.03</u>	<u>8.11</u>	<u>gushing</u>	<u>8.81</u>
Conductivity (µ mhos)	<u>292</u>	<u>323</u>	<u>432</u>	<u>340</u>	<u>335</u>	<u>gushing</u>	<u>332</u>
Water Temperature (°F)	<u>70.5</u>	<u>61.7</u>	<u>64.2</u>	<u>64.4</u>	<u>63.7</u>	<u>gushing</u>	<u>65.5</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal  
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-52

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2



# GROUNDWATER SAMPLING

TF4MW1

Sample ID: P4mw1Gw4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800</u>		DATE: <u>8-14-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>Site 4</u>				
WEATHER CONDITIONS <u>Sunny, warm</u>		AMBIENT TEMP: <u>76°F</u>				
PERSONNEL <u>PH Lay, m0 stoker</u>						
REVIEWED BY: <u>JSBmege 9/21/93</u> *samples unusable - arrived warm						
EQUIPMENT USED: <u>Bailer &amp; rope, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>35mw2</u>			Which well was previously sampled? <u>35mw2</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0926</u> Finished <u>0945</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>9 gals</u>			
Depth to bottom of well (ft.) <u>36.0'</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>23.2'</u>			Additional Comments <u>-</u>			
Length of water (ft.) <u>12.8</u>						
Volume of water (ft <sup>3</sup> ) <u>0.28</u>						
(gal.) <u>~2</u>						
Amount of sediment at bottom of well (ft.) <u>-</u>			Samples Collected: Start <u>1016</u>			
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>			Finish <u>1050</u>			
IN-SITU TESTING	Date:	<u>08/14/93</u>	<u>8/14/93</u>	<u>8-14-93</u>	<u>8-14-93</u>	<u>8-14-93</u>
	Time:	<u>0926</u>	<u>0930</u>	<u>0935</u>	<u>0940</u>	<u>0945</u>
Water Level		<u>23.2'</u>			<u>23.2</u>	<u>23.2</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>
Turbidity		<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>
Odor		<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>9.16</u>	<u>8.34</u>	<u>8.38</u>	<u>8.36</u>	<u>8.38</u>
Conductivity (µ mhos)		<u>314</u>	<u>268</u>	<u>272</u>	<u>268</u>	<u>264</u>
Water Temperature (°C)		<u>60.8</u>	<u>57.7</u>	<u>56.5</u>	<u>56.4</u>	<u>56.8</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

TF4MW1 Resample

Sample ID: P4 MW16W4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-17-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>Site 4 Third fire training area</u>				
WEATHER CONDITIONS <u>Hot, Hazy</u>		AMBIENT TEMP: <u>-85°F</u>				
PERSONNEL <u>Phelan &amp; M. Stoker</u>						
REVIEWED BY: <u>JS Brinzel</u> <u>9/21/93</u> * well resampled - samples arrived at lab warm						
EQUIPMENT USED: <u>Bailer, rope, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? _____			Which well was previously sampled? _____			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1442</u> Finished <u>1503</u>			
Stickup (ft.) <u>~2</u>			Volume purged <u>10 gals</u>			
Depth to bottom of well (ft.) <u>36'</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>23.21</u>			Additional Comments _____			
Length of water (ft.) <u>12.79</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.28</u>			_____			
(gal.) <u>~2</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>1523</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>1550</u>			
IN-SITU TESTING						
Date: <u>8-17-93</u>						
Time: <u>14:46</u>		<u>14:49</u>	<u>14:51</u>	<u>14:53</u>	<u>14:57</u>	<u>1501</u>
<u>1523</u>						
Water Level	<u>23.21</u>					<u>23.25</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u>
Turbidity	<u>sl</u>	<u>sl</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>7.75</u>	<u>7.64</u>	<u>7.70</u>	<u>7.67</u>	<u>7.68</u>	<u>7.65</u>
Conductivity (µ mhos)	<u>314</u>	<u>297</u>	<u>258</u>	<u>248</u>	<u>242</u>	<u>245</u>
Water Temperature (°C)	<u>64.0</u>	<u>66.2</u>	<u>59.9</u>	<u>56.8</u>	<u>56.7</u>	<u>56.7</u>
Notes: 1 ft. length of 4" = 0.087 m <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 m <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91						

TETC134

TF4 MW 2

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P046MW42

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>		
WELL NO. <u>P046 MW2</u> LOCATION <u>Site 4, Third Fire Training area</u>						
WEATHER CONDITIONS <u>cool Sunny</u>		AMBIENT TEMP: <u>~72°F</u>				
PERSONNEL <u>P.H. Lay, M.C. Stoker</u>						
REVIEWED BY: <u>JSBriegel 9/21/93</u>						
EQUIPMENT USED: <u>Bailer, rope, pump assembly + fittings, Filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P046 MW3</u>			Which well was previously sampled? <u>P4 MW3</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1009</u> Finished <u>1021</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>5 gallons</u>			
Depth to bottom of well (ft.) <u>37.2' BTOC</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>29' BTOC</u>			Additional Comments <u>—</u>			
Length of water (ft.) <u>8.2'</u>						
Volume of water (ft <sup>3</sup> ) <u>0.18</u>						
(gal.) <u>~1.3</u>						
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>1025</u>			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>1034</u>			
IN-SITU TESTING		Date: <u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>
		Time: <u>1009</u>	<u>1013</u>	<u>1017</u>	<u>1021</u>	<u>1034</u>
Water Level		<u>29'</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>29.03'</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>—</u>
Turbidity		<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>
Odor		<u>none</u>	<u>non</u>	<u>non</u>	<u>none</u>	<u>non</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>0</u>	<u>-0-</u>
pH (units)		<u>8.21</u>	<u>7.97</u>	<u>7.92</u>	<u>7.69</u>	<u>7.58</u>
Conductivity ( $\mu$ mhos)		<u>299</u>	<u>271</u>	<u>369</u>	<u>310</u>	<u>320</u>
Water Temperature (°C)		<u>60.1</u>	<u>58.1</u>	<u>56.8</u>	<u>56.5</u>	<u>56.7</u>
Notes: 1 ft. length of 4" = 0.057 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC134

# GROUNDWATER SAMPLING

TF4 MW3

Sample ID: P046MW3

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>		
WELL NO. <u>MW3</u>		LOCATION <u>Site 4 Third Fire training area</u>				
WEATHER CONDITIONS <u>cool -70°</u>		AMBIENT TEMP: <u>-70°</u>				
PERSONNEL <u>P. A. Lay, M. C. Stoker</u>						
REVIEWED BY: <u>J. S. Buegel 9/21/93</u>						
EQUIPMENT USED: <u>Bailer, pump assembly, fittings, filter, rope</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>none</u>			Which well was previously sampled? <u>none</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>0858</u> Finished <u>0920</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>7.5 gal</u>			
Depth to bottom of well (ft.) <u>36.7 BTOC</u>			Comments on Well Recovery <u>immediate</u>			
Depth to water surface (ft.) <u>24.85 BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>10.05</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>2.49-11-93</u>			_____			
(gal.) <u>1.6 gal</u>			_____			
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>0925</u>			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>0940</u>			
IN-SITU TESTING		Date: <u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>
Time: <u>0858</u>		<u>0906</u>	<u>0912</u>	<u>0918</u>	<u>0920</u>	<u>0940</u>
Water Level		<u>26.85</u>			<u>26.94</u>	<u>26.95</u>
Well Volume Purged (gal.)		<u>in. fluid</u>	<u>2 gal</u>	<u>3.5</u>	<u>5 gal</u>	<u>7 gal</u>
Turbidity		<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>8.22</u>	<u>7.71</u>	<u>8.30</u>	<u>8.37</u>	<u>8.26</u>
Conductivity (µ mhos)		<u>477</u>	<u>424</u>	<u>431</u>	<u>424</u>	<u>414</u>
Water Temperature (°F)		<u>60.2</u>	<u>58.8</u>	<u>58.4</u>	<u>58.6</u>	<u>58.5</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

TF4MW4

Sample ID: P046MW4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931500-12</u>		DATE: <u>8-12-93</u>	
WELL NO. <u>MW4</u>		LOCATION <u>Site 4 Third Free Training Area</u>			
WEATHER CONDITIONS <u>Sunny, hot, hazy</u>		AMBIENT TEMP: <u>85°F</u>			
PERSONNEL <u>PH. L., M. S. Stoker</u>					
REVIEWED BY: <u>J. Smigel 8/21/93</u>					
EQUIPMENT USED: <u>Bailer, Pump 8-2-93, pump assembly</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>		
How was the device decontaminated? <u>See Logbook</u>			How was the device decontaminated? <u>See Logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P02MW5</u>			Which well was previously sampled? <u>P02MW5</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1454</u> Finished <u>1513</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>7.5 gal.</u>		
Depth to bottom of well (ft.) <u>86.4' BTOC</u>			Comments on Well Recovery <u>moderate</u>		
Depth to water surface (ft.) <u>27.56' BTOC</u>			Additional Comments <u>—</u>		
Length of water (ft.) <u>8.84'</u>			Samples Collected: Start <u>1545</u>		
Volume of water (ft <sup>3</sup> ) <u>0.194</u>			Finish <u>1615</u>		
(gal.) <u>~1.4</u>					
Amount of sediment at bottom of well (ft.) <u>—</u>					
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>					
IN-SITU TESTING					
Date:	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>	<u>8-12-93</u>
Time:	<u>1454</u>	<u>1458</u>	<u>1503</u>	<u>1506</u>	<u>1545</u>
Water Level	<u>27.56</u>	<u>—</u>	<u>—</u>	<u>33.35'</u>	<u>27.67</u>
Well Volume Purged (gal.)	<u>~0-</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>~</u>
Turbidity	<u>clear</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>	<u>sl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>~0-</u>	<u>~0-</u>	<u>~0-</u>	<u>~0-</u>	<u>~0-</u>
pH (units)	<u>8.26</u>	<u>8.20</u>	<u>8.28</u>	<u>8.32</u>	<u>8.46</u>
Conductivity (µ mhos)	<u>437</u>	<u>314</u>	<u>326</u>	<u>414</u>	<u>110</u>
Water Temperature (°C)	<u>61.7</u>	<u>59.6</u>	<u>60.4</u>	<u>60.1</u>	<u>60.2</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal					
Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91					

TEC154

# GROUNDWATER SAMPLING

Sample ID: PSMW1GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8-15-93  
WELL NO. MW1 LOCATION Site S old 6th 2nd Fire training area  
WEATHER CONDITIONS Cool, windy, cloudy AMBIENT TEMP: ~72°F  
PERSONNEL M. Stoker & D. Lay  
REVIEWED BY: DJT

EQUIPMENT USED: Pump, hose, Bailor, Filter

## PURGING DEVICE

Type Device? Pump  
How was the device decontaminated? See logbook  
How was the line decontaminated? ded. catel  
Which well was previously purged? P8mw1

## SAMPLING DEVICE

Type Device? Bailor  
How was the device decontaminated? See logbook  
How was the line decontaminated? ded. catel  
Which well was previously sampled? P8mw1

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
Stickup (ft.) ~2'  
Depth to bottom of well (ft.) 22.33'  
Depth to water surface (ft.) 7.29  
Length of water (ft.) 15.04  
Volume of water (ft<sup>3</sup>) 0.33  
(gal.) 2.4  
Amount of sediment at bottom of well (ft.) \_\_\_\_\_  
LNAPL (ft.) \_\_\_\_\_ DNAPL (ft.) \_\_\_\_\_

## PURGING

Time started 1423 Finished 1515  
Volume purged 13.5 gals  
Comments on Well Recovery Immediate  
Additional Comments \_\_\_\_\_  
Samples Collected: Start 1530  
Finish 1550

## IN-SITU TESTING

	Date: <u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>
Time:	<u>1423</u>	<u>1433</u>	<u>1439</u>	<u>1450</u>	<u>1458</u>	<u>1512</u>	<u>1530</u>
Water Level	<u>7.29'</u>						<u>7.35</u>
Well Volume Purged (gal.)	<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>13</u>	<u>15</u>
Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>
Odor	<u>SI, organic</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>
Organic Vapor (ppm)	<u>-0-</u>						
pH (units)	<u>6.94</u>	<u>6.61</u>	<u>6.15</u>	<u>6.17</u>	<u>6.50</u>	<u>6.90</u>	<u>6.78</u>
Conductivity (µ mhos)	<u>517</u>	<u>445</u>	<u>454</u>	<u>438</u>	<u>451</u>	<u>474</u>	<u>468</u>
Water Temperature (°C)	<u>65.6</u>	<u>64.7</u>	<u>62.9</u>	<u>63.5</u>	<u>62.8</u>	<u>61.7</u>	<u>62.3</u>

Notes:

1 ft. length of 4"

= 0.087 ft<sup>3</sup> or 0.65 gal.

1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Turbidity choices:

clear, turbid, opaque

Revision Date: 2-8-91

TETC154

## GROUNDWATER SAMPLING

Sample ID: PSMW26W4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>981800-12</u>		DATE: <u>8-13-93</u>	
WELL NO. <u>MW2</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>Sunny, hot, hazy</u>		AMBIENT TEMP: <u>82°F</u>			
PERSONNEL <u>PHLag, MS Blizard</u>					
REVIEWED BY: <u>DEF</u>					
EQUIPMENT USED: <u>Bailer, Pump Assembly, Filter</u>					

<p>PURGING DEVICE</p> <p>Type Device? <u>Bailer</u></p> <p>How was the device decontaminated? <u>See logbook</u></p> <p>How was the line decontaminated? <u>dedicated</u></p> <p>Which well was previously purged? <u>P5MW4</u></p>	<p>SAMPLING DEVICE</p> <p>Type Device? <u>Bailer</u></p> <p>How was the device decontaminated? <u>See logbook</u></p> <p>How was the line decontaminated? <u>dedicated</u></p> <p>Which well was previously sampled? <u>P5MW4</u></p>
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<p>INITIAL WELL VOLUME</p> <p>Well diameter (in.) <u>2"</u></p> <p>Stickup (ft.) <u>1'</u></p> <p>Depth to bottom of well (ft.) <u>21.2' BT6C</u></p> <p>Depth to water surface (ft.) <u>6.4' BT6C</u></p> <p>Length of water (ft.) <u>14.8'</u></p> <p>Volume of water (ft<sup>3</sup>) _____</p> <p>(gal.) <u>~2.4</u></p> <p>Amount of sediment at bottom of well (ft.) _____</p> <p>LNAPL (ft.) _____ DNAPL (ft.) _____</p>	<p>PURGING</p> <p>Time started <u>1750</u> Finished <u>1800</u></p> <p>Volume purged <u>10 gals</u></p> <p>Comments on Well Recovery <u>Immediate</u></p> <p>Additional Comments _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Samples Collected: Start <u>1812 1835</u>  <u>PMLG-1393</u>  Finish <u>1825 1845</u></p>
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IN-SITU TESTING	Date:	8-13-93	8-13-93	8-13-93	8-13-93	8-13-93	8-13-93
	Time:	<u>1750</u>	<u>1752</u>	<u>1754</u>	<u>1757</u>	<u>1800</u>	<u>1835</u>
Water Level		<u>6.4'</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>6.65</u>	<u>6.45</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>
Turbidity		<u>none</u>	<u>SL</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>7.69</u>	<u>7.90</u>	<u>7.69</u>	<u>7.55</u>	<u>7.54</u>	<u>7.79</u>
Conductivity (µ mhos)		<u>149</u>	<u>198</u>	<u>197</u>	<u>203</u>	<u>193</u>	<u>210</u>
Water Temperature (°C)		<u>20.1</u>	<u>46.7</u>	<u>65.4</u>	<u>64.9</u>	<u>64.6</u>	<u>67.6</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.

Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Resample

Sample ID: PO5MW26W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/24/93  
 WELL NO. MW2 LOCATION Site 5  
 WEATHER CONDITIONS Sunny, breezy, warm AMBIENT TEMP: ~ 75 °F  
 PERSONNEL P. Lay + J Smith  
 REVIEWED BY: DFT

EQUIPMENT USED: Pump & hose, teflon bailer

## PURGING DEVICE

Type Device? peristaltic  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? it's new  
 Which well was previously purged? Site 5, MW4

## SAMPLING DEVICE

Type Device? teflon bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? it's new  
 Which well was previously sampled? PO5MW46W4

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~ 2 ft  
 Depth to bottom of well (ft.) BTOC 21.2  
 Depth to water surface (ft.) 6.57  
 Length of water (ft.) 14.63  
 Volume of water (ft<sup>3</sup>) 0.32  
 (gal.) 2.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

## PURGING

Time started 1900 Finished 1925  
 Volume purged 7 gal  
 Comments on Well Recovery None  
 Additional Comments None  
 Samples Collected: Start 1925 Finish 1930

## IN-SITU TESTING

Date: 8/24/93  
 Time: 1900 1909 1918 1924 1928 1936  
 Water Level (ft BTOC) 6.57/8.70 7.92 7.07 NM 6.71 NM  
 Well Volume Purged (gal.) 0 < 1 2.5 5 7 7 7  
 Turbidity clear clear clear clear clear clear  
 Odor None None None None None None  
 Organic Vapor (ppm) NM NM NM NM NM NM  
 pH (units) 7.40 7.18 7.08 7.08 7.22 7.22  
 Conductivity (µ mhos) 141 145 152 153 149 149  
 Water Temperature (°C) 71.1 65.5 64.8 64.2 64.1 64.1

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = not measured

G-60

2.3 gal  
x 3

6.9 gallons in in

FIGURE 3-2





# GROUNDWATER SAMPLING

Sample ID: PSMW36W4

PROJECT NAME Phelps Collins RT JOB NO: 231500-R DATE: 8-13-93  
 WELL NO. MW3 LOCATION \_\_\_\_\_  
 WEATHER CONDITIONS Sunny, warm, hazy AMBIENT TEMP: -75°F  
 PERSONNEL PHL  
 REVIEWED BY: DFJ

EQUIPMENT USED: Pump, Bailer, hose, filter

## PURGING DEVICE

Type Device? Gas pump 2  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? P4MW5

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P4MW4

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) 22.47 BTDC  
 Depth to water surface (ft.) 8.07 BTDC  
 Length of water (ft.) 14.4  
 Volume of water (ft<sup>3</sup>) ~2.3  
 (gal.) \_\_\_\_\_  
 Amount of sediment at bottom of well (ft.) \_\_\_\_\_  
 LNAPL (ft.) \_\_\_\_\_ DNAPL (ft.) \_\_\_\_\_

## PURGING

Time started 1055 Finished 1144  
 Volume purged 11 gal  
 Comments on Well Recovery Moderate to Immediate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 1145  
 Finish 1152

## IN-SITU TESTING

Date:	8-12-93	8-13-93	8-13-93	8-13-93	8-13-93	8-13-93
Time:	1102	1108	1115	1126	1135	1145
Water Level	8.07					8.35
Well Volume Purged (gal.)	-0-	2 1/2 g	5g	7.5g	10g	-0-
Turbidity	none	none	none	none	none	none
Odor	none	none	none	none	none	none
Organic Vapor (ppm)	-0-	-0-	-0-	-0-	-0-	-0-
pH (units)	7.68	8.12	8.16	8.22	8.21	8.18
Conductivity (µ mhos)	263	272	266	268	259	267
Water Temperature (°C)	72.5	68.5	65.6	66.4	66.4	66.4

Notes:

1 ft. length of 4"

= 0.087 ft<sup>3</sup> or 0.65 gal.

1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal

Turbidity choices:

clear, turbid, opaque

Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P5MW4GW4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-13-93</u>		
WELL NO. <u>MW4</u>		LOCATION <u>Site 5</u>				
WEATHER CONDITIONS <u>Sunny, hot, hazy</u>		AMBIENT TEMP: <u>82°F</u>				
PERSONNEL <u>PHL ag, MS Blizzard</u>						
REVIEWED BY: <u>DFT</u>						
EQUIPMENT USED: <u>Bailer, pump assembly, Filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>P5MW3GW4</u>			Which well was previously sampled? <u>P5MW3GW4</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1708</u> Finished <u>1730</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>10</u>			
Depth to bottom of well (ft.) <u>23.65' BTOC</u>			Comments on Well Recovery <u>Immediate</u>			
Depth to water surface (ft.) <u>8.1' BTOC</u>			Additional Comments _____			
Length of water (ft.) <u>15.55'</u>			_____			
Volume of water (ft <sup>3</sup> ) _____			Sample Collected: Start <u>1812</u>			
(gal.) <u>~ 2.5</u>			Finish <u>1825</u>			
Amount of sediment at bottom of well (ft.) _____			_____			
LNAPL (ft.) _____ DNAPL (ft.) _____			_____			
IN-SITU TESTING	Date:	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>	<u>8-13-93</u>
	Time:	<u>1708</u>	<u>1720</u>	<u>1724</u>	<u>1726</u>	<u>1729</u>
Water Level		<u>8.1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>8.35</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>25</u>	<u>5</u>	<u>7.5</u>	<u>10</u>
Turbidity		<u>none</u>	<u>SL</u>	<u>Moderate</u>	<u>mod</u>	<u>mod</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>7.59</u>	<u>7.65</u>	<u>8.04</u>	<u>7.86</u>	<u>7.75</u>
Conductivity (µ mhos)		<u>173</u>	<u>194</u>	<u>208</u>	<u>208</u>	<u>206</u>
Water Temperature (°C)		<u>22.7</u>	<u>20.3</u>	<u>16.8</u>	<u>16.7</u>	<u>16.5</u>
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque. Revision Date: 2-8-91</p>						

TETC:154

# GROUNDWATER SAMPLING

Resample

Sample ID: P5MW4GW4

PROJECT NAME <u>Phelps Collins R1</u>		JOB NO: <u>93180012</u>		DATE: <u>8/24/93</u>	
WELL NO. <u>MW4</u>		LOCATION <u>Site 5</u>			
WEATHER CONDITIONS <u>Sunny, breezy, 80°F</u>		AMBIENT TEMP: <u>~80°F</u>			
PERSONNEL <u>P. Lay - J. Smith</u>					
REVIEWED BY: <u>DEFJ</u>					
EQUIPMENT USED: <u>pump, bailer, filter, hose</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>peristaltic</u>			Type Device? <u>bailer (Hagen)</u>		
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>see logbook</u>		
How was the line decontaminated? <u>new</u>			How was the line decontaminated? <u>new</u>		
Which well was previously purged? <u>MW3 Site 5</u>			Which well was previously sampled? <u>MW3 Site 5</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1624</u> Finished <u>1635</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>10 gal</u>		
Depth to bottom of well (ft.) BTDC <u>23.65</u>			Comments on Well Recovery <u>N/A</u>		
Depth to water surface (ft.) BTDC <u>8.25</u>			Additional Comments <u>none</u>		
Length of water (ft.) <u>15.4</u>			Samples Collected: Start <u>1640</u>		
Volume of water (ft <sup>3</sup> ) <u>0.3388</u>			Finish <u>1656</u>		
(gal.) <u>2.5 gal</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>					
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>					
IN-SITU TESTING					
Date: <u>8/24/93</u>					
Time: <u>1604</u>					
Water Level ft BTDC	<u>8.25</u>	<u>8.46</u>	<u>8.45</u>	<u>8.47</u>	<u>8.46</u>
Well Volume Purged (gal.)	<u>0</u>	<u>25</u>	<u>5</u>	<u>7.5</u>	<u>9</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>7.61</u>	<u>7.01</u>	<u>7.32</u>	<u>7.14</u>	<u>7.06</u>
Conductivity (µ mhos)	<u>184</u>	<u>167</u>	<u>228</u>	<u>180</u>	<u>181</u>
Water Temperature (°F)	<u>74.6</u>	<u>71.5</u>	<u>70.4</u>	<u>70.5</u>	<u>70.6</u>
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91</p>					

TETC154

stop pumping @ 1440 collect metals

G-63

NM = not measured  
 N/A = not applicable  
 FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW5GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. 5 LOCATION Sik 5  
 WEATHER CONDITIONS cloudy, breezy, dry AMBIENT TEMP: 70°F  
 PERSONNEL J. Smith & M. Stoker  
 REVIEWED BY: DEF

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Peristaltic Pump</u>	Type Device? <u>for metals → peristaltic pump</u>
How was the device decontaminated? <u>see logbook</u>	Type Device? <u>teflon bailer for VOCs, SVOCs, TPH</u>
How was the line decontaminated? <u>see logbook</u>	How was the device decontaminated? <u>potable + allonox → potable → DI water → methanol; air dry</u>
Which well was previously purged? <u>Sik 8 MW4</u>	How was the line decontaminated? <u>disposable new nylon cord used each time</u>
	Which well was previously sampled? <u>P5MW4GW4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1348</u> Finished <u>1404</u>
Stickup (ft.) <u>~2'</u>	Volume purged <u>7 gallons</u>
Depth to bottom of well (ft.) <u>BTOC</u> <u>15.5'</u>	Comments on Well Recovery <u>none</u>
Depth to water surface (ft.) <u>BTOC</u> <u>6.32</u>	Additional Comments <u>none</u>
Length of water (ft.) <u>9.18</u>	
Volume of water (ft <sup>3</sup> ) <u>0.2</u>	
(gal.) <u>1.5</u>	
Amount of sediment at bottom of well (ft.) <u>NM</u>	Sample Collected: Start <u>1404</u>
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	1410 sample time Finish <u>1416</u>

1.5  
3  
4.5 gallons  
minimum

IN-SITU TESTING	Date: <u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>	<u>8/29/93</u>		
	Time: <u>1348</u>	<u>1353</u>	<u>1358</u>	<u>1403</u>	<u>1416</u>		
Water Level # <u>BTOC</u>	<u>6.57</u>	<u>6.67</u>	<u>6.68</u>	<u>6.68</u>	<u>6.65</u>		
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>turbid</u>		
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>		
Organic Vapor (ppm)	<u>NM</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>		
pH (units)	<u>7.28</u>	<u>6.70</u>	<u>6.93</u>	<u>6.96</u>	<u>7.13</u>		
Conductivity (µ mhos)	<u>648</u>	<u>712</u>	<u>707</u>	<u>687</u>	<u>688</u>		
Water Temperature (°F)	<u>70.8</u>	<u>68.7</u>	<u>68.9</u>	<u>68.5</u>	<u>68.3</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-64

BTOC = Below Top of (PVC or steel) casing  
 JSS 8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW6GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW6 LOCATION Site 5  
 WEATHER CONDITIONS cloudy, breezy, dry AMBIENT TEMP: 70°F  
 PERSONNEL M. Spiller & J. Smith  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 5 MW7

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? potable + alconox → potable → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P5MW7 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) 2'  
 Depth to bottom of well (ft.) BTOC 15.5  
 Depth to water surface (ft.) BTOC 6.36'  
 Length of water (ft.) 9.14'  
 Volume of water (ft<sup>3</sup>) 0.20  
 (gal.) 1.5  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1519 Finished 1535  
 Volume purged 7 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1535  
 1540 Finish 1540

IN-SITU TESTING Date: 8/29/93

	Time: <u>1519</u>	<u>1525</u>	<u>1530</u>	<u>1535</u>	<u>1546</u>		
Water Level <u>ft BTOC</u>	<u>6.75</u>	<u>6.80</u>	<u>6.81</u>	<u>6.83</u>	<u>6.80</u>		
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>		
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>turbid</u>		
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>		
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>		
pH (units)	<u>7.94</u>	<u>7.43</u>	<u>7.58</u>	<u>7.60</u>	<u>7.62</u>		
Conductivity (μ mhos)	<u>308</u>	<u>344</u>	<u>357</u>	<u>360</u>	<u>374</u>		
Water Temperature <u>(°F)</u>	<u>68.5</u>	<u>65.9</u>	<u>65.7</u>	<u>65.6</u>	<u>65.7</u>		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-65

BTOC = Below Top of <sup>PVC</sup> (outer steel) casing  
AS of 2/6/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5MW76W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW7 LOCATION Site 5  
 WEATHER CONDITIONS cloudy, breezy AMBIENT TEMP: 70 °F  
 PERSONNEL M. Shih + J. Smith  
 REVIEWED BY: PAW

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 5 MW5

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P5 MW5G W4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 15.5  
 Depth to water surface (ft.) BTOC 7.24  
 Length of water (ft.) 8.26  
 Volume of water (ft<sup>3</sup>) 0.18  
 (gal.) 1.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1429 Finished 1444  
 Volume purged 7 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 1444 Finish 1456  
1449

1.3  
3  
3.9 gal  
min.

IN-SITU TESTING	Date: 8/29/93	8/29/93	8/29/93	8/29/93	8/29/93		
	Time: 1429	1435	1440	1444	1456		
Water Level ft BTOC	7.33	7.34	7.36	7.36	NM		
Well Volume Purged (gal.)	0	2	4	6	7		
Turbidity	clear	clear	clear	clear	turbid		
Odor	none	none	none	none	none		
Organic Vapor (ppm)	NM	NM	NM	NM	NM		
pH (units)	7.20	6.95	7.05	7.00	8.06		
Conductivity (µ mhos)	154	171	184	194	249		
Water Temperature (°F)	66.9	64.7	65.6	65.2	65.7		

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-66

BTOC = Below Top of (PVC) casing  
 HS 8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P5mw8Gw4

PROJECT NAME phelps Gillis ANG JOB NO: \_\_\_\_\_ DATE: 9/13/93  
 WELL NO. mw8 LOCATION Site 5 2nd FTA  
 WEATHER CONDITIONS Windy Sunny AMBIENT TEMP: ~70°F  
 PERSONNEL PHLay + BEN  
 REVIEWED BY: DET

EQUIPMENT USED: Pump, Bailer, hose rope, Filter

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Pump</u>	Type Device? <u>Bailer</u>
How was the device decontaminated? <u>See logbook</u>	How was the device decontaminated? <u>See logbook</u>
How was the line decontaminated? <u>dedicated</u>	How was the line decontaminated? <u>dedicated</u>
Which well was previously purged? <u>P3mw7</u>	Which well was previously sampled? <u>P3mw7</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1114</u> Finished <u>1200</u>
Stickup (ft.) <u>2'</u>	Volume purged <u>12</u>
Depth to bottom of well (ft.) <u>22' BTOC</u>	Comments on Well Recovery <u>Immediate</u>
Depth to water surface (ft.) <u>7.1' BTOC</u>	Additional Comments _____
Length of water (ft.) <u>14.9'</u>	_____
Volume of water (ft <sup>3</sup> ) <u>0.327</u>	_____
(gal.) <u>2.38</u>	_____
Amount of sediment at bottom of well (ft.) _____	Sample Collected: Start <u>1205</u>
LNAPL (ft.) _____ DNAPL (ft.) _____	Finish <u>1220</u>

IN-SITU TESTING	Date: <u>9/13/93</u>	_____	_____	_____	_____	_____
Time: <u>1114</u>	<u>1124</u>	<u>1035</u>	<u>1145</u>	<u>1200</u>	_____	_____
Water Level <u>7.1</u>	<u>7.33</u>	_____	_____	<u>7.38</u>	_____	_____
Well Volume Purged (gal.) <u>initial</u>	<u>9</u>	<u>6</u>	<u>9</u>	<u>12</u>	_____	_____
Turbidity <u>none</u>	<u>SL</u>	<u>SL</u>	<u>SL</u>	<u>SL</u>	_____	_____
Odor <u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>SL</u>	_____	_____
Organic Vapor (ppm) _____	_____	_____	_____	_____	_____	_____
pH (units) <u>9.44</u>	<u>9.84</u>	<u>9.38</u>	<u>10.02</u>	<u>See logbook at MW</u>	_____	_____
Conductivity (µ mhos) _____	_____	_____	_____	_____	_____	_____
Water Temperature (°C) <u>66.5</u>	<u>64.2</u>	<u>62.7</u>	<u>62.5</u>	<u>62.4</u>	_____	_____

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91



# GROUNDWATER SAMPLING

Sample ID: PSmw96w4

PROJECT NAME Phelps Collins AWG RT JOB NO: 931800-12 DATE: 9/13/93  
 WELL NO. rw9 LOCATION Site 8  
 WEATHER CONDITIONS Hot AMBIENT TEMP: 75°F  
 PERSONNEL PHC + DJJ  
 REVIEWED BY: DJJ

EQUIPMENT USED: \_\_\_\_\_

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? PSmw8

## SAMPLING DEVICE

Type Device? Baler  
 How was the device decontaminated? Dedicated from  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? PSmw5

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) 2'  
 Depth to bottom of well (ft.) 20.6  
 Depth to water surface (ft.) 7.36  
 Length of water (ft.) 13.24  
 Volume of water (ft<sup>3</sup>) 0.29  
 (gal.) 2.1  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1114 Finished 1136  
 Volume purged 11  
 Comments on Well Recovery Immediate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 1550  
 Finish 1600

IN-SITU TESTING	Date:	9/14/93	9/14/93	9/14/93				
	Time:	1140	1143	1150				
Water Level								
Well Volume Purged (gal.)		Initial	5	10				
Turbidity		SL	SL	SL				
Odor		SL	SL	SL				
Organic Vapor (ppm)		—	—	—				
pH (units)		—	See logbook	unable				
Conductivity (μ mhos)		—	See logbook	Localize PH/cond.				
Water Temperature (°C)		64.6	64.5	63.2				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

LF6MW1

Sample ID: Pole6MW1

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>		
WELL NO. <u>MW1</u>		LOCATION <u>Site 6/7</u>				
WEATHER CONDITIONS <u>warm hazy humid</u>		AMBIENT TEMP: <u>~82°F</u>				
PERSONNEL <u>PHLey and M. S. Stokes</u>						
REVIEWED BY: <u>JS Bruegel 9/21/93</u>						
EQUIPMENT USED: <u>peristaltic pump, bailer, dedicated rope</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>GEO pump 2</u>			Type Device? <u>Pump/Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>POLE6MW2</u>			Which well was previously sampled? _____			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1900</u> Finished <u>1955</u>			
Stickup (ft.) <u>2'</u>			Time started <u>PUL 8-11-93</u>			
Depth to bottom of well (ft.) <u>36.05 BTOC</u>			Volume purged <u>11 gal/s.</u>			
Depth to water surface (ft.) <u>18.59 BTOC</u>			Comments on Well Recovery <u>Immediate</u>			
Length of water (ft.) <u>17.46</u>			Additional Comments _____			
Volume of water (ft <sup>3</sup> ) _____			_____			
(gal.) <u>~2.8</u>			_____			
Amount of sediment at bottom of well (ft.) _____			Samples Collected: Start <u>2006</u>			
LNAPL (ft.) _____ DNAPL (ft.) _____			Finish <u>2025</u>			
IN-SITU TESTING						
Date:	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>
Time:	<u>1900</u>	<u>1921</u>	<u>1951</u>	<u>1940</u>	<u>1950</u>	<u>2006</u>
Water Level	<u>18.49</u>	<u>18.59</u>	<u>18.59</u>	<u>18.59</u>	<u>18.59</u>	<u>18.62</u>
Well Volume Purged (gal.)	<u>-0-</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>
Turbidity	<u>SL</u>	<u>-</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Odor	<u>None</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)	<u>10.52</u>	<u>9.44</u>	<u>9.58</u>	<u>9.43</u>	<u>9.16</u>	<u>9.26</u>
Conductivity (µ mhos)	<u>185</u>	<u>203</u>	<u>233</u>	<u>235</u>	<u>243</u>	<u>241</u>
Water Temperature (°C)	<u>60.2</u>	<u>58.1</u>	<u>58.1</u>	<u>57.8</u>	<u>57.9</u>	<u>57.8</u>
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal						
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91						

TETC154

# GROUNDWATER SAMPLING

LF6MW2

Sample ID: P066mw2

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-11-93</u>			
WELL NO. <u>MW2</u>		LOCATION <u>Site 6</u>					
WEATHER CONDITIONS <u>hazy humid overcast</u>		AMBIENT TEMP: <u>78-82°F</u>					
PERSONNEL <u>PA Lay and ME Stoker</u>							
REVIEWED BY: <u>JS Bruegel 9/21/93</u>							
EQUIPMENT USED: <u>Pump, hose, Bailer, pump assembly</u>							
PURGING DEVICE			SAMPLING DEVICE				
Type Device? <u>Bailer - Geopung 2</u>			Type Device? <u>Bailer/Pump</u>				
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>				
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>				
Which well was previously purged? <u>P04GMW2</u>			Which well was previously sampled? <u>P04GMW2</u>				
INITIAL WELL VOLUME			PURGING				
Well diameter (in.) <u>2"</u>			Time started <u>1540</u> Finished <u>1620</u>				
Stickup (ft.) <u>2'</u>			Volume purged <u>~12 gal</u>				
Depth to bottom of well (ft.) <u>28.2' BTOC</u>			Comments on Well Recovery <u>immediat</u>				
Depth to water surface (ft.) <u>12.59' BTOC</u>			Additional Comments _____				
Length of water (ft.) <u>15.61'</u>			_____				
Volume of water (ft <sup>3</sup> ) _____			Sample Collected: Start <u>1620</u>				
(gal.) <u>~2.5</u>			Finish <u>1629</u>				
Amount of sediment at bottom of well (ft.) _____			_____				
LNAPL (ft.) _____ DNAPL (ft.) _____			_____				
IN-SITU TESTING	Date:	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>	<u>8-11-93</u>
	Time:	<u>1540</u>	<u>15:50</u>	<u>15:58</u>	<u>16:06</u>	<u>16:12</u>	<u>16:29</u>
Water Level		<u>12.59'</u>					<u>12.63'</u>
Well Volume Purged (gal.)		<u>-0-</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10</u> Final ~ 12
Turbidity		<u>slt none</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>	<u>5/</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
pH (units)		<u>11.87</u>	<u>7.84</u>	<u>8.12</u>	<u>8.36</u>	<u>8.52</u>	<u>8.54</u>
Conductivity (µ mhos)		<u>278</u>	<u>209</u>	<u>294</u>	<u>314</u>	<u>301</u>	<u>308</u>
Water Temperature (°C)		<u>16.8</u>	<u>62.6</u>	<u>59.6</u>	<u>58.9</u>	<u>59.9</u>	<u>59.8</u>
Notes: 1 ft. length of 4" = 0.057 ft <sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91							

FETC154

LF6MW3

# GROUNDWATER SAMPLING

Sample ID: P6MW3GW4

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/26/93  
 WELL NO. MW3 LOCATION Site 6  
 WEATHER CONDITIONS P. cloudy, humid, calm AMBIENT TEMP: ~80°F  
 PERSONNEL J. Smith & P. Lay  
 REVIEWED BY: J. Bruegel 9/21/93

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 3 MW5

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? D3 MW5 GW4 & P3 MW9 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTOC 39.95 JWS 12/13  
 Depth to water surface (ft.) BTOC 15.16  
 Length of water (ft.) 24.49  
 Volume of water (ft<sup>3</sup>) 10.54  
 (gal.) 3.97  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1331 Finished 1421  
 Volume purged 14 gallons  
 Comments on Well Recovery \_\_\_\_\_  
 Additional Comments pH meter is drifting; pH readings are suspect.  
 Samples Collected: Start 1422  
1430 on sample Finish 1432  
1445 on sample  
1450 on sample

IN-SITU TESTING	Date:	8/26/93					
	Time:	1331	1345	1400	1416	1421	1432
Water Level if BTOC		15.97	16.04	16.06	16.09	15.66	NM
Well Volume Purged (gal.)		0	4	6.7	12	14	
Turbidity		clear	clear	clear	clear	clear	clear
Odor		None	None	none	none	none	none
Organic Vapor (ppm)		NM	NM	NM	NM	NM	NM
pH (units)		7.69	9.63	9.56	10.40	11.69	
Conductivity (μ mhos)		349	294	3.02	396	362	
Water Temperature (°F)		76.3	62.1	59.9	65.2	59.5	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-71

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

4  
4  
16 gal  
12 total  
see purging comments above

LFLMW4

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P6MW4GW4

PROJECT NAME <u>Phelps Collins R1</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/30/93</u>	
WELL NO. <u>MW4</u>		LOCATION <u>Site 6</u>			
WEATHER CONDITIONS <u>cloudy, sl. breezy, about 60°F</u>		AMBIENT TEMP: <u>60 °F</u>			
PERSONNEL <u>Smith &amp; M. Stiles</u>					
REVIEWED BY: <u>J. S. Buegel 9/21/93</u>					
EQUIPMENT USED: <u>Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Peristaltic Pump</u>			Type Device? <u>formetals → peristaltic pump</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>potable + alconox → potable</u>		
How was the line decontaminated? <u>See logbook</u>			How was the line decontaminated? <u>DI water → methanol; airdry</u>		
Which well was previously purged? <u>Site 6 MWS</u>			Which well was previously sampled? <u>disposable new nylon cord used each time</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>0906</u> Finished <u>0930</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>5</u> gallons		
Depth to bottom of well (ft.) <u>BTOC ~20</u>			Comments on Well Recovery		
Depth to water surface (ft.) <u>BTOC 12.05</u>			Additional Comments		
Length of water (ft.) <u>7.95</u>			Sample Collected: Start <u>0930</u>		
Volume of water (ft <sup>3</sup> ) <u>0.17</u>			Finish <u>0935</u>		
(gal.) <u>1.3</u>					
Amount of sediment at bottom of well (ft.) <u>NM</u>					
LNAPL (ft.) <u>NM</u>			DNAPL (ft.) <u>NM</u>		
IN-SITU TESTING					
Date:	<u>8/30/93</u>	<u>09/01/93</u>	<u>09/08/93</u>	<u>09/15/93</u>	<u>09/22/93</u>
Time:	<u>0906</u>	<u>0912</u>	<u>0918</u>	<u>0924</u>	<u>0930</u>
Water Level ft. BTOC	<u>12.28</u>	<u>12.63</u>	<u>12.70</u>	<u>12.71</u>	<u>12.72</u>
Well Volume Purged (gal.)	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Turbidity	<u>clear</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>	<u>cl</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>8.49</u>	<u>7.95</u>	<u>7.94</u>	<u>7.92</u>	<u>7.93</u>
Conductivity (µmhos)	<u>371</u>	<u>374</u>	<u>378</u>	<u>384</u>	<u>382</u>
Water Temperature (°F)	<u>60.4</u>	<u>59.5</u>	<u>56.9</u>	<u>57.1</u>	<u>57.0</u>
Notes: 1 ft. length of 4" = 0.007 ft <sup>3</sup> or 0.05 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal.					
Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC154

NM = Not Measured

G-72

BTOC = Below Top of (Outer steel) casing

FIGURE 3-2

LF6 MW 5

The Earth Technology Corporation

## GROUNDWATER SAMPLING

Sample ID: P6MW5G W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93  
 WELL NO. MW5 LOCATION Site 6  
 WEATHER CONDITIONS Cloudy, slightly breezy AMBIENT TEMP: 65°F  
 PERSONNEL J. Smith M. Stulen  
 REVIEWED BY: J. P. Megeel 2/21/93

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? Site 5 MW6

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? potable + alconox → potable → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? PS MW6 G W 4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BDC ~20  
 Depth to water surface (ft.) BDC 10.82 + 18.82 = 29.64  
 Length of water (ft.) 9.18  
 Volume of water (ft<sup>3</sup>) 0.2  
 (gal.) 1.5  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0816 Finished 0837  
 Volume purged 7 gallons  
 Comments on Well Recovery Recovery to ~90' within 1 minute  
 Additional Comments none  
 Samples Collected: Start 0837  
840 Sample time Finish 0852

IN-SITU TESTING	Date: <u>8/30/93</u>					
	Time:	<u>0815</u>	<u>0821</u>	<u>0829</u>	<u>0837</u>	<u>0852</u>
Water Level ft BDC		<u>11.20</u>	<u>11.22</u>	<u>11.26</u>	<u>11.26</u>	<u>10.92</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>
Turbidity		<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>slightly turbid</u>
Odor		<u>NM</u>	<u>None</u>	<u>NM</u>	<u>None</u>	<u>NM</u>
Organic Vapor (ppm)		<u>NM</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NM</u>
pH (units)		<u>7.54</u>	<u>7.26</u>	<u>7.36</u>	<u>7.36</u>	<u>8.10</u>
Conductivity (µ mhos)		<u>232</u>	<u>236</u>	<u>244</u>	<u>238</u>	<u>261</u>
Water Temperature (°F)		<u>65.5</u>	<u>62.5</u>	<u>62.2</u>	<u>62.4</u>	<u>63.2</u>

Notes: 1 ft. length of 4" = 0.087 m<sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 m<sup>3</sup> or 0.18 gal  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC:134

NM = Not Measured

G-73

at N - Robinson Tool (After steel casing)  
 PVC 1/2" ID

FIGURE 3-2

LF6 MW 6

The Earth Technology Corporation

# GROUNDWATER SAMPLING

Sample ID: P6MW6GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/30/93  
 WELL NO. MW6 LOCATION Site 6 in woods  
 WEATHER CONDITIONS cloudy, drizzling, humid AMBIENT TEMP: 65°F  
 PERSONNEL J. Smith & M. Stokes  
 REVIEWED BY: J. Smigel 9/21/93

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE	SAMPLING DEVICE
Type Device? <u>Peristaltic Pump</u>	Type Device? <u>metals → peristaltic pump</u>
How was the device decontaminated? <u>see logbook</u>	How was the device decontaminated? <u>potable + alconox → potable → DI water → methanol; air dry</u>
How was the line decontaminated? <u>see logbook</u>	How was the line decontaminated? <u>disposable new nylon cord used each time</u>
Which well was previously purged? <u>Site 6 MW4</u>	Which well was previously sampled? <u>P6MW4GW4</u>

INITIAL WELL VOLUME	PURGING
Well diameter (in.) <u>2"</u>	Time started <u>1134</u> Finished <u>1215</u>
Stickup (ft.) <u>~2'</u>	Volume purged <u>11 gallons</u>
Depth to bottom of well (ft.) BOC <u>34.90'</u>	Comments on Well Recovery <u>none</u>
Depth to water surface (ft.) BOC <u>10.19</u>	Additional Comments <u>none</u>
Length of water (ft.) <u>18.71'</u>	
Volume of water (ft <sup>3</sup> ) <u>0.41</u>	
(gal.) <u>3.0</u>	
Amount of sediment at bottom of well (ft.) <u>NM</u>	Sample Collected: Start <u>1215</u>
LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	Finish <u>1229</u>

9 gallons minimum

IN-SITU TESTING	Date: <u>8/30/93</u>						
	Time: <u>1134</u>	<u>1148</u>	<u>1158</u>	<u>1205</u>	<u>1210</u>	<u>1215</u>	<u>1229</u>
Water Level ft BOC	<u>NM</u>	<u>17.54</u>	<u>17.60</u>	<u>17.61</u>	<u>17.61</u>	<u>17.61</u>	<u>47.2</u> NM
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>10.8</u> 30/33	<u>11 gal</u>
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>CI</u>	<u>CI</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>*</u>						
Conductivity (µ mhos)	<u>442</u>	<u>419</u>	<u>419</u>	<u>438</u>	<u>445</u>	<u>434</u>	<u>428</u>
Water Temperature (°F) <u>US 8/31/93</u>	<u>61.3</u>	<u>55.2</u>	<u>55.3</u>	<u>56.7</u>	<u>55.6</u>	<u>55.8</u>	<u>55.5</u>

Notes: 1 ft. length of 4" = 0.057 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque. Revision Date: 2-8-91

TETC154

NM = Not Measured

G-74

+ pH meter is broken.

BOC = Below Top of (PVC Outer Steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

LF6 MW 8

Sample ID: PL6MW8GW9

PROJECT NAME Phelps Collins ANG RI JOB NO: 931800-12 DATE: 9/8/93  
 WELL NO. nw8 LOCATION Site 6 old Land Fill  
 WEATHER CONDITIONS cool AMBIENT TEMP: ~68°  
 PERSONNEL PHCay and BFNorton  
 REVIEWED BY: JSAmeyel 9/21/93

EQUIPMENT USED: Bailer, pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P9mw4

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? P9mw4

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) 2'  
 Depth to bottom of well (ft.) 15' BTOC  
 Depth to water surface (ft.) 11.89 BTOC  
 Length of water (ft.) 3.11  
 Volume of water (ft<sup>3</sup>) 0.068  
 (gal.) 0.5  
 Amount of sediment at bottom of well (ft.) —  
 LNAPL (ft.) — DNAPL (ft.) —

## PURGING

Time started 1313 Finished 1324  
 Volume purged 3  
 Comments on Well Recovery Slow  
 Additional Comments —  
 Samples Collected: Start 1410 Finish 1420

IN-SITU TESTING	Date: 9/8/93	9/8/93	9/8/93	9/9/93	9/8/93	9/8/93	
	Time: 1313	1316	1320	1322	1324	1420	
Water Level	11.89	—	—	—	—	11.88	
Well Volume Purged (gal.)	—	1 gal	2	2.5	3	—	
Turbidity	very	very	very	very	mod	mod	
Odor	sl.	sl.	sl.	sl.	mod.	mod	
Organic Vapor (ppm)	—	—	—	—	—	—	
pH (units)	6.81	6.97	6.94	7.16	7.10	7.06	
Conductivity (μ mhos)	343	446	493	462	515	486	
Water Temperature (°C)	64.4	60.8	60.7	60.2	59.5	60.4	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91



# GROUNDWATER SAMPLING

LF6MW9

Sample ID: Pl6mw9gw4

PROJECT NAME <u>Phelps Collins ANG RE</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/8/93</u>		
WELL NO. <u>mwa</u>		LOCATION <u>Site 6 Landfill</u>				
WEATHER CONDITIONS <u>Sunny</u>		AMBIENT TEMP: <u>~70</u>				
PERSONNEL <u>PH Lay and BF Noctor</u>						
REVIEWED BY: <u>JSBmezel 9/21/93</u>						
EQUIPMENT USED: <u>Bailer, pump assembly, filter</u>						
PURGING DEVICE			SAMPLING DEVICE			
Type Device? <u>Bailer</u>			Type Device? <u>Bailer</u>			
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>			
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>			
Which well was previously purged? <u>Pl6mw8</u>			Which well was previously sampled? <u>Pl6mw8</u>			
INITIAL WELL VOLUME			PURGING			
Well diameter (in.) <u>2"</u>			Time started <u>1330</u> Finished <u>1342</u>			
Stickup (ft.) <u>2'</u>			Volume purged <u>3.5</u>			
Depth to bottom of well (ft.) <u>14.8 BTOL</u>			Comments on Well Recovery <u>Slow</u>			
Depth to water surface (ft.) <u>10.79 BTOL</u>			Additional Comments _____			
Length of water (ft.) <u>4.01</u>			_____			
Volume of water (ft <sup>3</sup> ) <u>0.088</u>			Samples Collected: Start <u>1440</u>			
(gal.) <u>0.65</u>			Finish <u>1450</u>			
Amount of sediment at bottom of well (ft.) <u>—</u>			_____			
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			_____			
IN-SITU TESTING						
Date:	<u>9/8/93</u>	<u>9/9/93</u>	<u>9/8/93</u>	<u>9/6/93</u>	<u>9/8/93</u>	<u>9/8/93</u>
Time:	<u>1330</u>	<u>1334</u>	<u>1337</u>	<u>1340</u>	<u>1342</u>	<u>1450</u>
Water Level	<u>10.79'</u>	—	—	—	—	<u>10.79</u>
Well Volume Purged (gal.)	—	<u>1</u>	<u>2</u>	<u>3</u>	<u>3.5</u>	—
Turbidity	<u>51</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>	<u>mod</u>
Odor	—	—	—	—	—	—
Organic Vapor (ppm)	—	—	—	—	—	—
pH (units)	<u>7.27</u>	<u>7.45</u>	<u>7.51</u>	<u>7.55</u>	<u>7.57</u>	<u>7.49</u>
Conductivity (µ mhos)	<u>442</u>	<u>465</u>	<u>485</u>	<u>459</u>	<u>499</u>	<u>472</u>
Water Temperature (°C)	<u>59.6</u>	<u>58.4</u>	<u>57.3</u>	<u>57.8</u>	<u>57.2</u>	<u>57.8</u>
<p>Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.</p> <p>Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91</p>						

TETC154

# GROUNDWATER SAMPLING

Sample ID: 26M10GW4

PROJECT NAME Phelps Collins ANG RT JOB NO: 931800-12 DATE: 9/15/93  
 WELL NO. MW10 LOCATION Site 6 LF  
 WEATHER CONDITIONS Cool windy AMBIENT TEMP: 60°F  
 PERSONNEL PHL and DFT  
 REVIEWED BY: LSR

EQUIPMENT USED: Bailer

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? 26M106

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconex + DI, DI rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? \_\_\_\_\_

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) -2'  
 Depth to bottom of well (ft.) 15  
 Depth to water surface (ft.) 11'  
 Length of water (ft.) 4'  
 Volume of water (ft<sup>3</sup>) 0.088  
 (gal.) 0.64  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started 2025 Finished 2048  
 Volume purged 5 galls  
 Comments on Well Recovery moderate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 0725  
9/16/93 Finish 0730

## IN-SITU TESTING

Date:	9/15/93	9/15/93	9/15/93				
Time:	2025	2035	2048				
Water Level	<u>4'</u>	<u>-</u>	<u>4.2'</u>				
Well Volume Purged (gal.)	<u>0</u>	<u>2.5</u>	<u>5</u>				
Turbidity	<u>sl.</u>	<u>mod</u>	<u>very</u>				
Odor	<u>biological</u>	<u>-</u>	<u>-</u>				
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>				
pH (units)	<u>unable to calibrate</u>	<u>-</u>	<u>-</u>				
Conductivity (μ mhos)	<u>pH and Cond</u>	<u>-</u>	<u>-</u>				
Water Temperature (°C)	<u>64.4</u>	<u>64.8</u>	<u>64.7</u>				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

# GROUNDWATER SAMPLING

Sample ID: P3mw16w4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>8-15-93</u>																																																																								
WELL NO. <u>mw1</u>		LOCATION <u>Site 8, old Hangar 9</u>																																																																										
WEATHER CONDITIONS <u>cool cloudy</u>		AMBIENT TEMP: <u>~70°F</u>																																																																										
PERSONNEL <u>PHLung, MESToken</u>																																																																												
REVIEWED BY: <u>RJT</u>																																																																												
EQUIPMENT USED: <u>Pump, hose, Bailor, rope, filter</u>																																																																												
PURGING DEVICE			SAMPLING DEVICE																																																																									
Type Device? <u>PAL 1545 Pump</u>			Type Device? <u>Bailor</u>																																																																									
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>																																																																									
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>																																																																									
Which well was previously purged? <u>P3mw1</u>			Which well was previously sampled? <u>P3mw1</u>																																																																									
INITIAL WELL VOLUME			PURGING																																																																									
Well diameter (in.) <u>2"</u>			Time started <u>1042</u> Finished <u>1125</u>																																																																									
Stickup (ft.) <u>-0.3</u>			Volume purged <u>11 gals</u>																																																																									
Depth to bottom of well (ft.) <u>25' BTOC</u>			Comments on Well Recovery <u>immediate</u>																																																																									
Depth to water surface (ft.) <u>10.9' BTOC</u>			Additional Comments _____																																																																									
Length of water (ft.) <u>14.1'</u>			_____																																																																									
Volume of water (ft <sup>3</sup> ) <u>0.3102</u>			_____																																																																									
(gal.) <u>~2.25</u>			_____																																																																									
Amount of sediment at bottom of well (ft.) <u>—</u>			Samples Collected: Start <u>1126</u>																																																																									
LNAPL (ft.) <u>—</u> DNAPL (ft.) <u>—</u>			Finish <u>1146</u>																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>8-15-93</u></th> <th><u>8-15-93</u></th> <th><u>8-15-93</u></th> <th><u>8-15-93</u></th> <th><u>8-15-93</u></th> <th><u>8-15-93</u></th> </tr> </thead> <tbody> <tr> <td>Time:</td> <td><u>1042</u></td> <td><u>1052</u></td> <td><u>1102</u></td> <td><u>1110</u></td> <td><u>1119</u></td> <td><u>1146</u></td> </tr> <tr> <td>Water Level</td> <td><u>10.9</u></td> <td></td> <td></td> <td></td> <td></td> <td><u>11.05</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>-0.</u></td> <td><u>2.5</u></td> <td><u>5</u></td> <td><u>7.5</u></td> <td><u>10</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> </tr> <tr> <td>Odor</td> <td><u>none</u></td> <td><u>none</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> <td><u>-0.</u></td> </tr> <tr> <td>pH (units)</td> <td><u>8.08</u></td> <td><u>8.05</u></td> <td><u>7.85</u></td> <td><u>7.89</u></td> <td><u>7.83</u></td> <td><u>7.84</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>303</u></td> <td><u>330</u></td> <td><u>326</u></td> <td><u>332</u></td> <td><u>333</u></td> <td><u>331</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>63.1</u></td> <td><u>61.2</u></td> <td><u>59.8</u></td> <td><u>60.2</u></td> <td><u>60.1</u></td> <td><u>60.3</u></td> </tr> </tbody> </table>							IN-SITU TESTING	Date: <u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	Time:	<u>1042</u>	<u>1052</u>	<u>1102</u>	<u>1110</u>	<u>1119</u>	<u>1146</u>	Water Level	<u>10.9</u>					<u>11.05</u>	Well Volume Purged (gal.)	<u>-0.</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>	Turbidity	<u>none</u>	<u>none</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	Odor	<u>none</u>	<u>none</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	Organic Vapor (ppm)	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	pH (units)	<u>8.08</u>	<u>8.05</u>	<u>7.85</u>	<u>7.89</u>	<u>7.83</u>	<u>7.84</u>	Conductivity (µ mhos)	<u>303</u>	<u>330</u>	<u>326</u>	<u>332</u>	<u>333</u>	<u>331</u>	Water Temperature (°C)	<u>63.1</u>	<u>61.2</u>	<u>59.8</u>	<u>60.2</u>	<u>60.1</u>	<u>60.3</u>
IN-SITU TESTING	Date: <u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>	<u>8-15-93</u>																																																																						
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Water Level	<u>10.9</u>					<u>11.05</u>																																																																						
Well Volume Purged (gal.)	<u>-0.</u>	<u>2.5</u>	<u>5</u>	<u>7.5</u>	<u>10</u>	<u>-</u>																																																																						
Turbidity	<u>none</u>	<u>none</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>	<u>-0.</u>																																																																						
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pH (units)	<u>8.08</u>	<u>8.05</u>	<u>7.85</u>	<u>7.89</u>	<u>7.83</u>	<u>7.84</u>																																																																						
Conductivity (µ mhos)	<u>303</u>	<u>330</u>	<u>326</u>	<u>332</u>	<u>333</u>	<u>331</u>																																																																						
Water Temperature (°C)	<u>63.1</u>	<u>61.2</u>	<u>59.8</u>	<u>60.2</u>	<u>60.1</u>	<u>60.3</u>																																																																						
<p>Notes: 1 ft. length of 4" = 0.087 m<sup>3</sup> or 0.65 gal      1 ft. length 2" = 0.022 m<sup>3</sup> or 0.16 gal</p> <p>Turbidity choices: clear, turbid, opaque      Revision Date: 2-8-91</p>																																																																												

TETC134

# GROUNDWATER SAMPLING

Sample ID: P8MWZGW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW2 LOCATION Site 8  
 WEATHER CONDITIONS p. cloudy, calm, cool AMBIENT TEMP: 65°F  
 PERSONNEL J. Smith + P. [unclear] M. Skalen  
 REVIEWED BY: DRJ

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Site 9 MW3

SAMPLING DEVICE for metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water + allonox → DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P9 MW3 GWS4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) 22'  
 Depth to bottom of well (ft.) BTOC 32.0  
 Depth to water surface (ft.) BTOC 17.90  
 Length of water (ft.) 14.1  
 Volume of water (ft<sup>3</sup>) 0.31  
 (gal.) 2.3 3.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0818 Finished 0850  
 Volume purged 9 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 0850  
 Sample times 0900 Finish 0904

2.3  
1.6  
846  
41  
256  
2.3  
6.0

IN-SITU TESTING	Date: <u>8/19/93</u>						
Time:	<u>0821</u>	<u>0831</u>	<u>0836</u>	<u>0844</u>	<u>0850</u>	<u>0904</u>	
Water Level <u>if BTOC</u>	<u>17.95</u>	<u>17.94</u>	<u>17.94</u>	<u>17.94</u>	<u>17.94</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.78</u>	<u>7.85</u>	<u>7.91</u>	<u>7.99</u>	<u>7.97</u>	<u>7.90</u>	
Conductivity (μ mhos)	<u>794</u>	<u>392</u>	<u>384</u>	<u>418</u>	<u>410</u>	<u>422</u>	
Water Temperature (°F) <u>8/29/93</u>	<u>60.9</u>	<u>54.8</u>	<u>54.8</u>	<u>54.4</u>	<u>54.6</u>	<u>55.6</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.18 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-79

BTOC = Below Top of (PVC outer steel) casing  
8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P8MW34W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/29/93  
 WELL NO. MW3 LOCATION Site 8  
 WEATHER CONDITIONS cloudy, calm, dry AMBIENT TEMP: 60 °F  
 PERSONNEL J. Smith & Mark Stokes  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? Site 8 MW2

SAMPLING DEVICE formetals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH  
 How was the device decontaminated? DI water → methanol, air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P8MW2 GW4

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~ 2'  
 Depth to bottom of well (ft.) BTOC 32.0  
 Depth to water surface (ft.) BTOC 17.88'  
 Length of water (ft.) 14.12  
 Volume of water (ft<sup>3</sup>) 0.31  
 (gal.) 2.3  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 0926 Finished 0948  
 Volume purged 8 gallons  
 Comments on Well Recovery none  
 Additional Comments none  
 Samples Collected: Start 0948  
 Sample time 1000 Finish 1002

2.3  
3  
6.9 gall  
minimum

IN-SITU TESTING	Date: <u>8/29/93</u>						
	Time: <u>0926</u>	<u>0934</u>	<u>0939</u>	<u>0945</u>	<u>0948</u>	<u>1002</u>	
Water Level <u>ft BTOC</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>17.91</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>7</u>	<u>8</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.84</u>	<u>7.62</u>	<u>7.70</u>	<u>7.65</u>	<u>7.65</u>	<u>8.18</u>	
Conductivity ( $\mu$ mhos)	<u>587</u>	<u>543</u>	<u>540</u>	<u>572</u>	<u>564</u>	<u>565</u>	
Water Temperature ( $^{\circ}$ F)	<u>58.8</u>	<u>58.8</u>	<u>55.8</u>	<u>55.9</u>	<u>54.9</u>	<u>56.9</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-80

BTOC = Below Top of (outer steel) casing  
PVC  
8/29/93

FIGURE 3-2

# GROUNDWATER SAMPLING

Blind Duplicate P8 MW96W4 @ 1230

Sample ID: P8 MW4CWT

@ 1140

PROJECT NAME Phelps Collins R1 JOB NO: 931800-12 DATE: 8/29/93

WELL NO. MW4 LOCATION Site 8

WEATHER CONDITIONS partly cloudy, calm, dry AMBIENT TEMP: 70°F

PERSONNEL J. Smith, P. Edg, M. Stover

REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE

Type Device? Peristaltic Pump

How was the device decontaminated? see logbook

How was the line decontaminated? see logbook

Which well was previously purged? Site 8 MW3

SAMPLING DEVICE metals → peristaltic pump

Type Device? teflon bailer for VOCs, SVOCs, TPH

How was the device decontaminated? DI water → methanol; air dry

How was the line decontaminated? disposable new nylon cord used each time

Which well was previously sampled? P8 MW3 G104

INITIAL WELL VOLUME

Well diameter (in.) 2"

Stickup (ft.) ~2'

Depth to bottom of well (ft.) BTOC 56.5

Depth to water surface (ft.) BTOC 18.18

Length of water (ft.) 38.32

Volume of water (ft<sup>3</sup>) 0.8

(gal.) 6.1

Amount of sediment at bottom of well (ft.) some silt NM

LNAPL (ft.) NM DNAPL (ft.) NM

PURGING

Time started 1020 Finished 1137

Volume purged 22 gallons

Comments on Well Recovery none

Additional Comments none

Sample Collected: Start 1137

Sample time 1140 Finish 1157

IN-SITU TESTING	Date: <u>8/29/93</u>						
	Time:	<u>1020</u>	<u>1043</u>	<u>1052</u>	<u>1105</u>	<u>1121</u>	<u>1136</u>
Water Level <u>if BTOC</u>		<u>18.24</u>	<u>18.24</u>	<u>18.24</u>	<u>18.25</u>	<u>18.24</u>	<u>18.24</u>
Well Volume Purged (gal.)		<u>0</u>	<u>4</u>	<u>8</u>	<u>12</u>	<u>16</u>	<u>20</u>
Turbidity		<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)		<u>8.59</u>	<u>8.52</u>	<u>8.24</u>	<u>8.16</u>	<u>8.48</u>	<u>8.55</u>
Conductivity (µ mhos)		<u>337</u>	<u>320</u>	<u>318</u>	<u>321</u>	<u>319</u>	<u>323</u>
Water Temperature (°F)		<u>59.9</u>	<u>57.7</u>	<u>56.1</u>	<u>57.6</u>	<u>58.0</u>	<u>58.7</u>

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.

Turbidity choices: clear, turbid, opaque

Revision Date: 2-8-91

TETC154

NM = Not Measured

G-81

BTOC = Below Top of (outer steel) casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P8mw5gw4

PROJECT NAME <u>Phelps Collins</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/13/93</u> <small>PHL</small>	
WELL NO. <u>mw5</u>		LOCATION <u>Site B</u>			
WEATHER CONDITIONS <u>Rainy</u>		AMBIENT TEMP: <u>~55°F</u>			
PERSONNEL <u>PHLag, DFJag</u>					
REVIEWED BY: <u>DFJ</u>					
EQUIPMENT USED: <u>Bailer rope hand pump assembly, filter</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Bailer</u>			Type Device? <u>Bailer - Seal <sup>PHL</sup> bag</u>		
How was the device decontaminated? <u>See logbook</u>			How was the device decontaminated? <u>See logbook</u>		
How was the line decontaminated? <u>dedicated</u>			How was the line decontaminated? <u>dedicated</u>		
Which well was previously purged? <u>P5mw9</u>			Which well was previously sampled? _____		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>1450</u> Finished <u>1510</u>		
Stickup (ft.) <u>-0.3</u>			Volume purged <u>7 gals</u>		
Depth to bottom of well (ft.) <u>19.55</u>			Comments on Well Recovery <u>immediate</u>		
Depth to water surface (ft.) <u>11.38</u>			Additional Comments _____		
Length of water (ft.) <u>8.17</u>			_____		
Volume of water (ft <sup>3</sup> ) <u>0.18</u>			_____		
(gal.) <u>1.3</u>			_____		
Amount of sediment at bottom of well (ft.) <u>-</u>			Samples Collected: Start <u>1112</u>		
LNAPL (ft.) <u>-</u> DNAPL (ft.) <u>-</u>			9/14/93 Finish <u>1130</u>		
IN-SITU TESTING					
Date:	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/13/93</u>	<u>9/14/93</u>	_____
Time:	<u>1445</u>	<u>1458</u>	<u>1510</u>	<u>1510</u>	_____
Water Level	<u>11.38</u>	_____	<u>11.40</u>	_____	_____
Well Volume Purged (gal.)	<u>0</u>	<u>3.5</u>	<u>7</u>	<u>-</u>	_____
Turbidity	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	_____
Odor	<u>SI</u>	<u>SI</u>	<u>SI</u>	<u>SI</u>	_____
Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	_____
pH (units)	<u>unable to calibrate</u>				_____
Conductivity (µ mhos)	<u>pH and conductivity</u>				_____
Water Temperature (°C)	<u>63.5</u>	<u>64.2</u>	<u>64.1</u>	<u>64.3</u>	_____
Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal. Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P9MW1GW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/27/93  
 WELL NO. MW1 LOCATION Sik 9  
 WEATHER CONDITIONS hot, humid, sunny AMBIENT TEMP: ~85°F  
 PERSONNEL P. Lay, J. Smith  
 REVIEWED BY: D. F. J.

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord  
 PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? see logbook  
 How was the line decontaminated? see logbook  
 Which well was previously purged? Sik 9 MW1  
 SAMPLING DEVICE metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH + metal  
 How was the device decontaminated? DI water → methanol; air dry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled? P9MW2GW14

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BDC 31.85  
 Depth to water surface (ft.) BDC 18.54  
 Length of water (ft.) 13.31  
 Volume of water (ft<sup>3</sup>) —  
 (gal.) 2.1  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM  
 PURGING  
 Time started 1043 Finished 1057  
 Volume purged 9 gallons  
 Comments on Well Recovery none  
 Additional Comments pH meter may be drifting, pH readings are suspect  
 Samples Collected: Start 1530 Finish 1548  
1545

IN-SITU TESTING Date: 8/27/93

	Time: <u>1043</u>	<u>1046</u>	<u>1049</u>	<u>1054</u>	<u>1057</u>	<u>1530</u>	<u>7</u>
Water Level: <u>if BDC</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>18.53</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	
Turbidity	<u>clear</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>sl. turbid</u>	<u>clear/turbid</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
Organic Vapor (ppm)	<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>7.84</u>	<u>8.81</u>	<u>8.90</u>	<u>9.40</u>	<u>9.14</u>	<u>4</u>	
Conductivity (µ mhos)	<u>488</u>	<u>4.56</u>	<u>4.90</u>	<u>4.81</u>	<u>5.12</u>	<u>413</u>	
Water Temperature (°F)	<u>63.9</u>	<u>60.8</u>	<u>58.4</u>	<u>58.9</u>	<u>78.6</u>	<u>58.7</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC154

NM = Not Measured

G-83

BDC = Below Top of (Outer steel) casing

FIGURE 3-2



# GROUNDWATER SAMPLING

Sample ID: P9 MW 4

PROJECT NAME <u>Phelps Collins RI</u>		JOB NO: <u>931800-12</u>		DATE: <u>8/27/93</u>	
WELL NO. <u>NW2</u>		LOCATION <u>Site 9</u>			
WEATHER CONDITIONS <u>hot, humid, calm, sunny</u> AMBIENT TEMP: <u>~80°F</u>					
PERSONNEL <u>P. Lay + J. Smith</u>					
REVIEWED BY: <u>D. J. Taylor</u>					
EQUIPMENT USED: <u>Peristaltic pump + disposable polyethylene hose; teflon bailer with disposable nylon cord</u>					
PURGING DEVICE			SAMPLING DEVICE		
Type Device? <u>Peristaltic Pump</u>			Type Device? <u>teflon bailer for VOCs, SVOCs, TPH</u>		
How was the device decontaminated? <u>see logbook</u>			How was the device decontaminated? <u>DI water + alconox → DI water → methanol; air dry</u>		
How was the line decontaminated? <u>see logbook</u>			How was the line decontaminated? <u>disposable new nylon cord used each time</u>		
Which well was previously purged? <u>Site 9 MW5</u>			Which well was previously sampled? <u>P9 MW5, NW4</u>		
INITIAL WELL VOLUME			PURGING		
Well diameter (in.) <u>2"</u>			Time started <u>0949</u> Finished <u>1000</u>		
Stickup (ft.) <u>~2'</u>			Volume purged <u>6</u> gallons		
Depth to bottom of well (ft.) <u>BTOC</u> <u>33.77</u>			Comments on Well Recovery <u>none</u>		
Depth to water surface (ft.) <u>BTOC</u> <u>25.12</u>			Additional Comments <u>none</u>		
Length of water (ft.) <u>8.65</u>			Samples Collected: Start <u>1418</u> Finish <u>1445</u>		
Volume of water (ft <sup>3</sup> ) <u>—</u>			Amount of sediment at bottom of well (ft.) <u>NM</u>		
(gal.) <u>1.3</u>			LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>		
IN-SITU TESTING					
Date:	<u>8/27/93</u>				
Time:	<u>0949</u>	<u>0952</u>	<u>0953</u>	<u>0955</u>	<u>0956</u>
Water Level # <u>BTOC</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
Well Volume Purged (gal.)	<u>0</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Turbidity	<u>clear</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>	<u>v. turbid</u>
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)	<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)	<u>3.88</u>	<u>4.20</u>	<u>4.05</u>	<u>4.40</u>	<u>4.63</u>
Conductivity (μ mhos)	<u>7.85</u>	<u>7.98</u>	<u>8.29</u>	<u>8.46</u>	<u>8.71</u>
Water Temperature (°F)	<u>61.8</u>	<u>55.0</u>	<u>53.8</u>	<u>53.9</u>	<u>53.8</u>
Notes:	1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal				
Turbidity choices:	clear, turbid, opaque				
Revision Date: 2-6-91					

3 3  
8.65  
0.16  
51.90  
8650  
128.40

1.3 gal  
x 3 wells  
3.9 gallons  
in 3 well  
volume  
(minimum)

HNW

Just prior to sampling

>

TETC134

NM = Not Measured

G-84

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

just after sampling

# GROUNDWATER SAMPLING

Sample ID: P9 MW 3G, W4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/27/93  
 WELL NO. MW3 LOCATION Sik 9  
 WEATHER CONDITIONS hot, sunny, humid, slight breeze AMBIENT TEMP: 85 °F  
 PERSONNEL J Smith & P Lay  
 REVIEWED BY: DFT

EQUIPMENT USED: Peristaltic Pump & disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE  
 Type Device? Peristaltic Pump  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? See logbook  
 Which well was previously purged? MW1 Sik 9

SAMPLING DEVICE metals → peristaltic pump  
 Type Device? teflon bailer for VOCs, SVOCs, TPH, metals  
 How was the device decontaminated? DI water → H<sub>2</sub>O<sub>2</sub> → DI water → methanol; airdry  
 How was the line decontaminated? disposable new nylon cord used each time  
 Which well was previously sampled?

INITIAL WELL VOLUME  
 Well diameter (in.) 2"  
 Stickup (ft.) ~2'  
 Depth to bottom of well (ft.) BTC 5.68  
 Depth to water surface (ft.) BTC 15.31  
 Length of water (ft.) 17.37  
 Volume of water (ft<sup>3</sup>) 0.288  
 (gal.) 1.7  
 Amount of sediment at bottom of well (ft.) NM  
 LNAPL (ft.) NM DNAPL (ft.) NM

PURGING  
 Time started 1141 Finished 1154  
 Volume purged 8 gallons  
 Comments on Well Recovery  
 Additional Comments pH meter is drifting (using pH paper as well)  
 Samples Collected: Start 1640  
 Finish 1650

IN-SITU TESTING	Date: <u>8/27/93</u>						
	Time:	<u>1141</u>	<u>1144</u>	<u>1148</u>	<u>1151</u>	<u>1154</u>	<u>1650</u>
Water Level # <u>BTC</u>		<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>8.5(17)</u>	<u>15.31</u>
Well Volume Purged (gal.)		<u>0</u>	<u>2</u>	<u>4.5</u>	<u>6</u>	<u>8</u>	
Turbidity		<u>clear</u>	<u>turbid</u>	<u>turbid</u>	<u>turbid</u>	<u>turbid</u>	<u>SL</u>
Odor		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>
Organic Vapor (ppm)		<u>0</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>
pH (units)		<u>8.5(17)</u>	<u>8.4(17)</u>	<u>9.88(17)</u>	<u>9.54(17)</u>	<u>9.54(17)</u>	<u>(7)</u>
Conductivity (µ mhos)		<u>433</u>	<u>468</u>	<u>514</u>	<u>433</u>	<u>428</u>	<u>428</u>
Water Temperature (°F)		<u>65.4</u>	<u>57.9</u>	<u>59.5</u>	<u>57.9</u>	<u>57.4</u>	<u>58.7</u>

Notes: 1 ft. length of 4" = 0.007 ft<sup>3</sup> or 0.05 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134  
 NM = Not Measured  
 BTC = Below Top of (outer steel) casing  
 G-85  
 FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P9mw4 Gw4

PROJECT NAME <u>Phelps Collins RT</u>		JOB NO: <u>931800-12</u>		DATE: <u>9/8/93</u>																																																																																	
WELL NO. <u>mw4</u>		LOCATION <u>Site 9 Radar tower proposed location.</u>																																																																																			
WEATHER CONDITIONS <u>cool, cloudy</u>		AMBIENT TEMP: <u>~60°F</u>																																																																																			
PERSONNEL <u>PLCay and BF Norton</u>																																																																																					
REVIEWED BY: <u>DES</u>																																																																																					
EQUIPMENT USED: <u>Bailer, rope, pump assembly, filter</u>																																																																																					
<b>PURGING DEVICE</b> Type Device? <u>PHL Pump, rope Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously purged? <u>P2mw5 Resample</u>			<b>SAMPLING DEVICE</b> Type Device? <u>Bailer</u> How was the device decontaminated? <u>See logbook</u> How was the line decontaminated? <u>dedicated</u> Which well was previously sampled? <u>P2mw5 Resample</u>																																																																																		
<b>INITIAL WELL VOLUME</b> Well diameter (in.) <u>2"</u> Stickup (ft.) <u>~2'</u> Depth to bottom of well (ft.) <u>32.29' BTOC</u> Depth to water surface (ft.) <u>20.63' BTOC</u> Length of water (ft.) <u>11.66</u> Volume of water (ft <sup>3</sup> ) <u>0.256</u> (gal.) <u>1.865</u> Amount of sediment at bottom of well (ft.) <u>-</u> LNAPL (ft.) _____ DNAPL (ft.) _____			<b>PURGING</b> Time started <u>0850</u> Finished <u>0910</u> Volume purged <u>9</u> Comments on Well Recovery <u>Immediate</u> Additional Comments _____ Samples Collected: Start <u>1045</u> Finish <u>1100</u>																																																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>IN-SITU TESTING</th> <th>Date: <u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> <th><u>9/8/93</u></th> </tr> <tr> <th></th> <th>Time: <u>0850</u></th> <th><u>0855</u></th> <th><u>0858</u></th> <th><u>0900</u></th> <th><u>0905</u></th> <th><u>0910</u></th> <th><u>1100</u></th> </tr> </thead> <tbody> <tr> <td>Water Level</td> <td><u>20.63</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>20.64</u></td> </tr> <tr> <td>Well Volume Purged (gal.)</td> <td><u>initial</u></td> <td><u>2</u></td> <td><u>4</u></td> <td><u>6</u></td> <td><u>8</u></td> <td><u>9</u></td> <td><u>-</u></td> </tr> <tr> <td>Turbidity</td> <td><u>none</u></td> <td><u>sl.</u></td> <td><u>mod</u></td> <td><u>very</u></td> <td><u>very</u></td> <td><u>mod</u></td> <td><u>mod</u></td> </tr> <tr> <td>Odor</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Organic Vapor (ppm)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>pH (units)</td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> <td><u>-</u></td> </tr> <tr> <td>Conductivity (µ mhos)</td> <td><u>352</u></td> <td><u>328</u></td> <td><u>323</u></td> <td><u>332</u></td> <td><u>318</u></td> <td><u>323</u></td> <td><u>348</u></td> </tr> <tr> <td>Water Temperature (°C)</td> <td><u>52.4</u></td> <td><u>50.6</u></td> <td><u>50.1</u></td> <td><u>50.3</u></td> <td><u>50.2</u></td> <td><u>50.2</u></td> <td><u>51.2</u></td> </tr> </tbody> </table>						IN-SITU TESTING	Date: <u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>	<u>9/8/93</u>		Time: <u>0850</u>	<u>0855</u>	<u>0858</u>	<u>0900</u>	<u>0905</u>	<u>0910</u>	<u>1100</u>	Water Level	<u>20.63</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>20.64</u>	Well Volume Purged (gal.)	<u>initial</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>	<u>9</u>	<u>-</u>	Turbidity	<u>none</u>	<u>sl.</u>	<u>mod</u>	<u>very</u>	<u>very</u>	<u>mod</u>	<u>mod</u>	Odor	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	Organic Vapor (ppm)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	pH (units)	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	Conductivity (µ mhos)	<u>352</u>	<u>328</u>	<u>323</u>	<u>332</u>	<u>318</u>	<u>323</u>	<u>348</u>	Water Temperature (°C)	<u>52.4</u>	<u>50.6</u>	<u>50.1</u>	<u>50.3</u>	<u>50.2</u>	<u>50.2</u>	<u>51.2</u>
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Notes: 1 ft. length of 4" = 0.087 ft <sup>3</sup> or 0.65 gal 1 ft. length 2" = 0.022 ft <sup>3</sup> or 0.16 gal Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91																																																																																					

TETC154

# GROUNDWATER SAMPLING

Sample ID: P9MWSGW4

PROJECT NAME Phelps Collins RI JOB NO: 931800-12 DATE: 8/26/93  
 WELL NO. MW5 LOCATION Sik 9  
 WEATHER CONDITIONS p cloudy, humid, calm AMBIENT TEMP: -80°F  
 PERSONNEL J. Smith + P. Lay  
 REVIEWED BY: DFJ

EQUIPMENT USED: Peristaltic Pump + disposable polyethylene hose; teflon bailer with disposable nylon cord

PURGING DEVICE Type Device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>see logbook</u> How was the line decontaminated? <u>see logbook</u> Which well was previously purged? <u>Sik 6 MW3</u>	SAMPLING DEVICE <u>metals → peristaltic pump</u> Type Device? <u>teflon bailer for VOCs, SVOCs, TPH</u> How was the device decontaminated? <u>DI water + allonox → DI water → methanol; air dry</u> How was the line decontaminated? <u>disposable new nylon cord used each time</u> Which well was previously sampled? <u>P6 MW3 GW4</u>
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INITIAL WELL VOLUME Well diameter (in.) <u>2"</u> Stickup (ft.) <u>22'</u> Depth to bottom of well (ft.) <u>BTOC 53.65</u> Depth to water surface (ft.) <u>BTOC 21.57</u> Length of water (ft.) <u>32.08</u> Volume of water (ft <sup>3</sup> ) <u>0.7</u> (gal.) <u>5.13</u> Amount of sediment at bottom of well (ft.) <u>NM</u> LNAPL (ft.) <u>NM</u> DNAPL (ft.) <u>NM</u>	PURGING Time started <u>1547</u> Finished <u>1658</u> Volume purged <u>16 gallons</u> Comments on Well Recovery _____ Additional Comments <u>* PH meter is drifting; all readings are suspect</u> Samples Collected: Start <u>1659</u> Finish <u>1717</u>
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IN-SITU TESTING	Date: <u>8/26/93</u>						
	Time: <u>1547</u>	<u>1619</u>	<u>1635</u>	<u>1650</u>	<u>1659</u>	<u>1717</u>	
Water Level ft BTOC	<u>21.57</u>	<u>21.61</u>	<u>21.62</u>	<u>21.61</u>	<u>21.53</u>	<u>NM</u>	
Well Volume Purged (gal.)	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>16</u>	<u>16</u>	
Turbidity	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	
Organic Vapor (ppm)	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	<u>NM</u>	
pH (units)	<u>8.00</u>	<u>10.85</u>	<u>9.87</u>	<u>9.31</u>	<u>9.47</u>	<u>9.47</u>	
Conductivity (μ mhos)	<u>683</u>	<u>666</u>	<u>588</u>	<u>5.80</u>	<u>624</u>	<u>624</u>	
Water Temperature (°F)	<u>74.5</u>	<u>65.9</u>	<u>62.6</u>	<u>62.6</u>	<u>61.4</u>	<u>61.4</u>	

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

TETC134

NM = Not Measured

G-87

BTOC = Below Top of (Outer steel) Casing

FIGURE 3-2

# GROUNDWATER SAMPLING

Sample ID: P9MWLGW4

PROJECT NAME Phelps Collins AUG RT JOB NO: 931800-12 DATE: 9/14/93  
 WELL NO. mwc LOCATION Site 9 RT  
 WEATHER CONDITIONS Cool, Rainy AMBIENT TEMP: 80°F  
 PERSONNEL PHLay & DJS  
 REVIEWED BY: JSB

EQUIPMENT USED: Bailer, rope, hand pump assembly, filter

## PURGING DEVICE

Type Device? Bailer  
 How was the device decontaminated? See logbook  
 How was the line decontaminated? dedicated  
 Which well was previously purged? P9mws expurge

## SAMPLING DEVICE

Type Device? Bailer  
 How was the device decontaminated? Alconex + DI, DI Rinse  
 How was the line decontaminated? dedicated  
 Which well was previously sampled? \_\_\_\_\_

## INITIAL WELL VOLUME

Well diameter (in.) 2"  
 Stickup (ft.) - 0.3  
 Depth to bottom of well (ft.) 23.35  
 Depth to water surface (ft.) 14.44  
 Length of water (ft.) 8.91  
 Volume of water (ft<sup>3</sup>) 0.196  
 (gal.) 1.425  
 Amount of sediment at bottom of well (ft.) -  
 LNAPL (ft.) - DNAPL (ft.) -

## PURGING

Time started: 2037 Finished 2100  
 Volume purged 6 gallons  
 Comments on Well Recovery immediate  
 Additional Comments \_\_\_\_\_  
 Samples Collected: Start 1335  
 Finish 1350

## IN-SITU TESTING

Date:	9/14/93	9/14/93	9/14/93				
Time:	2037	2048	2100				
Water Level	14.44		14.44				
Well Volume Purged (gal.)	-	3	6				
Turbidity	none	sl.	mod				
Odor	mod	strong	strong				
Organic Vapor (ppm)	-	-	-				
pH (units)	unable to calibrate						
Conductivity (µ mhos)	PH and conductivity						
Water Temperature (°C)	58.5°F	58.1	59.5				

Notes: 1 ft. length of 4" = 0.087 ft<sup>3</sup> or 0.65 gal. 1 ft. length 2" = 0.022 ft<sup>3</sup> or 0.16 gal.  
 Turbidity choices: clear, turbid, opaque Revision Date: 2-8-91

## Appendix H: Surveying Data



# R S Scott Associates, Inc.

ARCHITECTS. ENGINEERS. SURVEYORS

405 RIVER STREET  
ALPENA, MICHIGAN 49707  
(517) 354-3178

November 4, 1987

W.O. 4-7347

ELEV.			ELEV.			
RT9 - MW1	=	691.00	SF5 - MW1	=	681.03	P.W. #1 - Conc. Floor
RT9 - MW2	=	692.85	SF5 - MW2	=	681.29(a)	Directly opposite well on
RT9 - MW3	=	685.50	SF5 - MW3	=	682.27	West Side = 683.10
RT9 - MW4	=	687.77	SF5 - MW4	=	681.97	
RT9 - MW5	=	687.85	SF5 - SB1	=	677.95	P.W. #2 - Conc. Floor
RT9 - SB1	=	691.27	SF5 - SB2	=	677.85	Directly North of well
RT9 - SB2	=	689.87	SF5 - SB3	=	680.05	casing = 685.43
RT9 - SB3	=	685.57	SF5 - SB4	=	678.95	
RT9 - SB4	=	687.01				P.W. #3 - Top of casing
RT9 - SB5	=	685.71	LF6 - MW1	=	690.54	with cap on = 680.16
RT9 - SB6	=	688.81	LF6 - MW2	=	685.01	
			LF6 - MW3	=	687.14	P.W. #4 - Conc. Floor
CG3 - MW1	=	687.96	FF7 - SB1	=	683.74	West Side = 693.59
CG3 - MW2	=	694.41	FF7 - SB2	=	682.64	
CG3 - MW3	=	690.01	FF7 - SB3	=	684.34	P.W. #5 - Top of well cas
CG3 - MW4	=	694.13	FF7 - SB4	=	682.54	under cap = 681.35
CG3 - MW5	=	694.26				
CG3 - SB1	=	691.92	Spring #1	=	649.66'	P.W. #6 - Well appears to
CG3 - SB2	=	691.72	Spring #2	=	649.78	under trailer - trailer
CG3 - SB3	=	692.22	Spring #3	=	644.19	floor at bathroom door
CG3 - SB4	=	692.02	Spring #7	=	646.23	= 681.51
CG3 - SB5	=	691.92	Spring #8	=	646.19	
CG3 - SB6	=	692.02				
CG3 - SB7	=	692.72	TF4 - MW1	=	690.24	Staff Gauge #1 = 674.42
CG3 - SB8	=	692.32	TF4 - MW2	=	688.63	Staff Gauge #2 = 672.65
CG3 - SB9	=	691.82	TF4 - MW3	=	685.00	Staff Gauge #3 = 673.41
CG3 - SB10	=	692.02	TF4 - MW4	=	686.14	Staff Gauge #4 = 673.08
			TF4 - SB1	=	686.23	Staff Gauge #5 = 673.21
HN8 - MW1	=	687.15	TF4 - SB2	=	686.33	Staff Gauge #6 = 642.51
HN8 - MW2	=	693.00	TF4 - SB3	=	686.43	
HN8 - MW3	=	693.65	TF4 - SB4	=	686.23	
HN8 - MW4	=	693.75				
HN8 - SB1	=	690.27				
			Galvanized Pipe Wells			
MP2 - MW1	=	684.63	#1	=	680.19	
MP2 - MW2	=	683.87	#2	=	680.13	
MP2 - SB1	=	682.56	#3	=	681.17	
MP - MW3	=	683.43	#4	=	678.10	
MP - MW4	=	683.59	#5	=	680.65	
MP - MW5	=	683.47	#6	=	681.77	
			#7	=	682.44	

Staff gauges 1-6 did not exist as of July 1993  
JSS 6/14/95

Staff gauges 1-6 did not  
exist on 6 July 1993  
JSB 6/14/95

NOTE: Elevations as shown were taken at the following locations:  
Monitoring Wells: Top of the rim, inside next to the hasp.  
Soil Borings: Ground surface at the boring location.  
Springs: At the water discharge point.  
Galvanized Pipe Wells: Top of casing below the cap.  
Staff Gauges: Top of the nail at the gauge.



August 23, 1988

	<u>ELEV.</u>
SF5 - MW2	= 680.31
Staff Gauge #6	= 634.46

- (a) Well and staff gauge were repaired in August 1988 due to damage.  
R.S. Scott shot new elevations in August 1988.

**Surveying Data - August 1993**



IDENTIFICATION NUMBER	REFERENCE POINT TYPE			EAST COORDINATE	NORTH (Y) COORDINATE	ELEVATION (Z) COORDINATE	
	VEIL	SOIL BORING	OTHER			GROUND	RD
SIW1	X			18224.98	15843.11	678.6	678.23
SIW2	X			18396.47	15431.11	681.8	681.16
SIW3	X			18267.71	15084.96	681.0	680.55
SIW4	X			18359.24	15875.88	679.3	678.94
SIW5	X			18045.17	15408.50		
SIW6	X			18078.39	15717.59	677.2	679.28
SIW11	X			17823.93	15389.00	676.1	677.74
SIW12	X			18168.06	15949.70	678.3	680.20
SIW13	X			18045.33	15421.99	678.0	680.27
SIW14	X			18299.83	15377.91	678.6	679.18
SIP21			PEIZOMETER	18132.60	15386.60	679.3	679.06
SIP22			PEIZOMETER	18366.38	15773.28	679.6	678.34
SIP23			PEIZOMETER	18369.31	15184.00	678.4	
SIS84		X		18247.68	15185.39	680.7	
SIS85		X		18188.20	15284.29	678.5	
SIS86		X		18300.10	15289.43	678.7	
SIS87		X		18088.90	15489.70	678.9	
SIS88		X		18193.58	15480.24	680.2	
SIS89		X		18244.70	15574.21	678.8	
SIS90		X		18331.07	15583.39	679.71	
SIS91		X		18315.98	15752.54	678.0	
SIS92		X		18407.33	15780.24	678.3	
SIS93		X		18177.83	15844.00	682.9	682.62
MP2MW1	X			18664.42	15876.93	681.6	683.78
MP2MW2	X			18089.82	16301.46	681.3	683.18
MP2MW3	X			18902.92	16708.65	681.4	683.44
MP2MW4	X			18902.95	16188.32	681.3	683.39
MP2MW5	X			18038.02	16585.46	683.1	682.85
MP2MW6	X			19255.95	18092.98	683.1	682.79
MP2MW7	X			18080.24	16115.91	683.3	
MP2S82		X		19157.12	16106.92	683.3	
MP2S83		X		18320.53	16085.84	683.4	
MP2S84		X		19287.27	16073.03	683.4	
MP2S85		X		18091.18	15850.30	682.6	
MP2S86		X		18979.30	15875.17	682.1	
MP2S87		X		19035.60	15784.71	682.3	
MP2S88		X		19281.44	16051.20	683.4	
MP2S89	X			20322.51	15856.35	685.7	687.87
CG3MW1	X			19865.45	16309.88	692.0	694.30
CG3MW2	X			19528.94	16008.16	687.9	688.80
CG3MW3	X			18657.11	16135.79	692.0	694.00
CG3MW4	X			18887.87	16414.48	693.6	694.00

D. R. Mac NEILL & ASSOC. 3-H D. R. Mac NEILL & ASSOC. 3-H



IDENTIFICATION NUMBER	REFERENCE POINT TYPE			EAST (X) COORDINATE	NORTH (Y) COORDINATE	ELEVATION (Z) COORDINATE	
	WELL	SOIL BORING	OTHER			GROUND	BM
LF6W65	X			17902.45	20034.26	881.8	883.71
LF6W66	X			18257.52	18411.45	685.3	687.18
LF6W67	X			17855.84	19828.03	684.1	686.00
LF6W68	X			19745.18	17984.61	682.9	685.01
LF6W69	X			18858.79	17950.27	682.3	684.21
LF6W70	X			17743.09	20075.35	680.7	682.70
HN6W71	X			20424.46	16241.29	687.3	687.11
HN6W72	X			20170.26	17023.30	680.8	682.91
HN6W73	X			20101.13	16583.59	691.4	683.47
HN6W74	X			20089.64	16588.20	691.6	683.84
HN6W75	X			20317.55	18880.22	687.8	687.49
HN6S82	X	X		20390.56	16478.64	688.3	
HN6S83		X		20321.60	16459.88	688.4	
HN6S84		X		20180.38	16618.05	689.9	
HN6S85		X		20334.98	18358.34	688.3	
HN6S86		X		20189.28	16433.67	691.2	
HN6S87		X		20166.87	16381.80	690.7	
HN6S88		X		20390.31	18381.25	688.4	
RT9W1	X			20224.36	17920.04	688.9	890.79
RT9W2	X			18887.73	18432.03	690.5	692.63
RT9W3	X			18545.58	18122.35	683.2	685.22
RT9W4	X			18673.73	18430.34	685.4	687.52
RT9W5	X			18888.42	18428.12	685.3	887.61
RT9W6	X			18675.51	18138.87	685.3	685.00
RT9W7			TEST WELL	18672.55	18244.83	686.1	
RT9W8			TEST WELL	18695.52	17813.68	685.7	
RT9S13		X		19887.45	17776.80	688.9	
SPRING #1			SPRING	19933.14	19214.74	651.2	
SPRING #2			SPRING	19584.35	19272.79	651.1	
SPRING #3			SPRING	19570.00	19361.67	648.7	
SPRING #4			SPRING	19516.17	19185.68	651.6	
SPRING #5			SPRING	19474.84	19172.83	652.5	
SPRING #6			SPRING	18338.55	19284.41	649.7	
B.M. IN 7" ASH			BENCHMARK	17678.96	20153.49		675.04
B.M. IN 20" WHITE PINE STUMP			BENCHMARK	17616.97	15505.52		674.72
B.M. IN 8" WHITE BIRCH			BENCHMARK	18581.73	19342.21		651.31
USGS COLLINS #1			BENCHMARK	20331.86	16706.53		688.56

\* B4 staff gauge # 3 (Site 6+7) 6/11/95  
 \* B4 staff gauge # 4 (Site 1) 6/14/95-150  
 \* Benchmark in sinkhole; used to determine elevation for staff gauge # 3 in sinkhole JIS 6/14/95  
 \* These are the only existing JIS 6/14/95

\* Staff gauge elevations are provided on Table B-1; do to for the staff gauges reference



JOHN ENGLER  
GOVERNOR

H 109423

STATE OF MICHIGAN  
DEPARTMENT OF COMMERCE

BOARD OF PROFESSIONAL SURVEYORS  
PROFESSIONAL SURVEYOR  
LICENSE

DUANE R MAC NEILL  
432 RIPLEY BLVD  
ALPENA MI 49707

PERMANENT ID. NO.

4001014237

EXPIRATION DATE

10/31/95

2515177

THIS DOCUMENT IS DULY  
ISSUED UNDER THE LAWS OF  
THE STATE OF MICHIGAN.



Collins 1956

PCR NGS 16 FEB 95

NAO 27  $\phi$  45 04 50.23900  
h 83 33 56.18500  
NAP 83  $\phi$  45 04 50.28171  
h 83 33 56.11395

Collins 1956 RM 1  
 $\phi$  45 04 50.  
h 83 33 56

AP 1966 STA B  
SCALED  
 $\phi$  45 07 02  
h 83 33 58

ARP 1966  
SCALED.  
 $\phi$  45 07 18  
h 87 38 04

NANCY.

301-713-3242 NGS info LINE  
CD ROM 50<sup>00</sup> (13 STATES)  
5<sup>1/4</sup> or 3<sup>1/2</sup> @ 30<sup>00</sup> BY COUNTY.

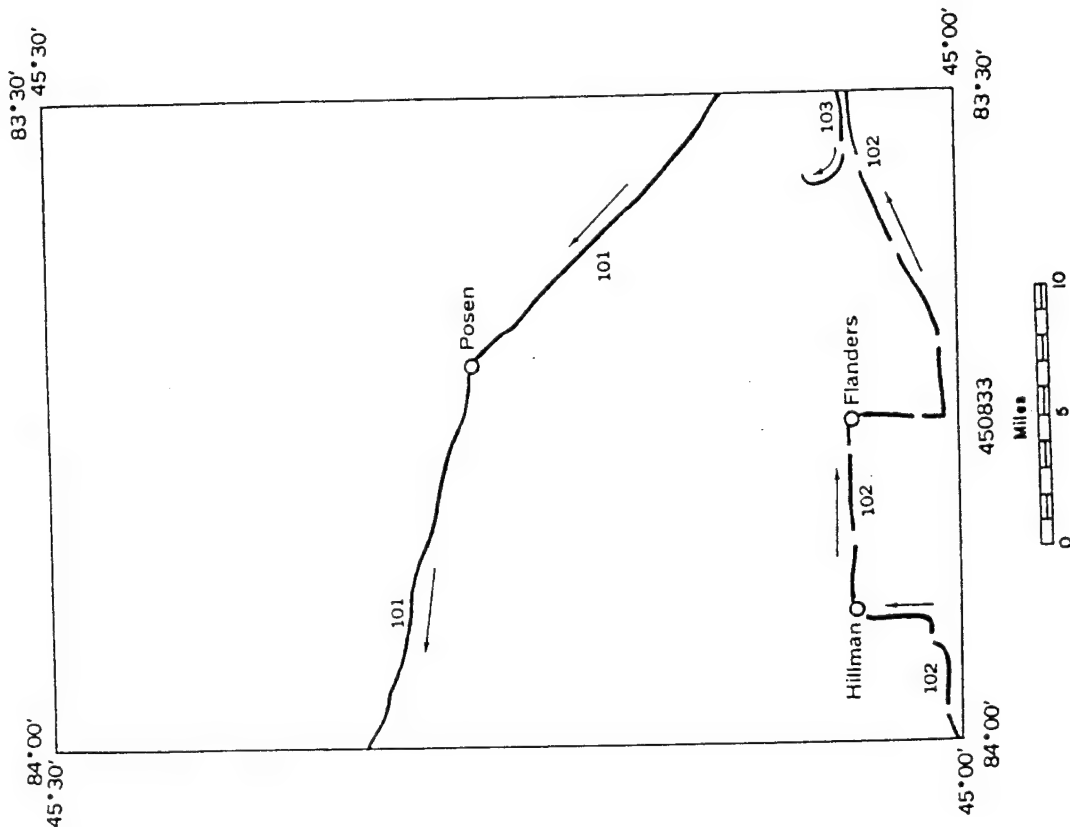
JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD - - - - - 1,50033  
HICHIKIAN  
LATITUDE 45° 00' 45" 30"  
LONGITUDE 84° 00' 45" 30"  
DIAGRAM ALPHA NL 17-7



REPLACES EARLIER LISTS

USCOMM-NOAA-ASHEVILLE

QUAD 420853  
 HIGHLIGHT  
 LATITUDE 15° 00' 30"  
 LONGITUDE 83° 30' 00"  
 DIAGRAM ALPENA

# VERTICAL CONTROL DATA

by the  
 NATIONAL GEODETIC SURVEY  
 SEA-LEVEL DATUM OF 1929

JANUARY 1973  
 U.S. DEPARTMENT OF COMMERCE  
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SURVEY  
 REPLACES ELEV. OF MARCH 1962

## LINE 101

ADJUSTMENT OF 1929 HZ L-2350

M. M. Gibson 1934 FLUCT-OIDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
HW 25 (DM RY)	214.633	704.175
Q 36	215.119	705.770
R 36	DESTROYED	
S 36	DESTROYED	
T 36	220.695	724.064
U 36	228.424	749.421
RV 26 (DM RY)	239.258	784.966
Y 36	248.902	816.606
Z 36	DESTROYED	
A 37	DESTROYED	
RV 27 (DM RY)	247.043	810.507
B 37	255.887	839.523
C 37	DESTROYED	

## LINE 102

ADJUSTMENT OF 1940 HZ L-2384

M. M. Gibson 1934 SECOND-ORDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
Z 79	258.181	847.049
C 80	237.483	779.142
D 80	221.022	725.136
E 80	232.169	761.708
F 80	233.520	766.140
J 80	226.083	741.741
L 80	207.755	681.610
M 80	201.151	659.943

## LINE 103

HZ L-20817

ADJUSTMENT OF 1966

E. T. Ogilby 8-11-66 8-19-66 SECOND-ORDER

BENCH MARK	ADJUSTED ELEVATION (Meters)	ADJUSTED ELEVATION (Feet)
C 183	192.816	632.597
D 183	202.191	663.555
E 183	203.664	668.188
AP 1966 STA A	207.530	680.215
P 183	209.687	687.948
COLLINS	209.720	688.056
COLLINS RM 1	209.875	688.558
COLLINS RM 2	210.107	689.326
ARP 1966	206.983	679.077

JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD 450033 PAGE NO. 5  
MICHIGAN 45° 00' 30"  
LATITUDE 87° 30' 00"  
LONGITUDE ALPENA  
DIAGRAM NL 17-7  
LINE 103

DESCRIPTION OF BENCH MARK

Designation AP 1966 STA A  
Nearest town Alpena  
Distance and direction from nearest town 6.5 mi. west  
Character of mark Standard topographic mark  
Established by USCGS  
Detailed description

The station is located at Phelps Collins Airport 175.0 ft east of the intersection of the centerline of runway and 36 and the end of the overrun. It is a standard topographic disk set in the top of a concrete post and is stamped "AP 1966 STA A".

LINE 103

DESCRIPTION OF BENCH MARK

Designation C 183  
Nearest town Alpena  
Distance and direction from nearest town 3.0 miles west  
Character of mark Standard disk  
Established by USCGS  
Detailed description

The mark is located 3.0 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks at the intersection of State Highway 32 and Walter Street 0.9 mile west of B 183 and 1.25 miles east of D 183, 90 feet west of the centerline of Walter Street, and 54 feet north of the centerline of State Highway 32. The mark is a standard disk stamped "C 183" and is set in the top of a large rounder which projects 3 feet and is 1 foot lower than the road.

DESCRIPTION OF BENCH MARK

Designation D 183  
Nearest town Alpena  
Distance and direction from nearest town 4.2 miles west  
Character of mark Standard disk  
Established by USCGS  
Detailed description

The mark is located 3.2 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks, 1.25 miles west of C 183, 0.85 mile east of E 183, on the property of the F. Wasko Small Animal Clinic, 74 feet south of the centerline of State Highway 32, 22 feet west of the centerline of the driveway to the clinic, and 3 feet west of a guyed power pole. It is a standard disk stamped "D 183 1966" set in top of a 6-inch concrete post flush with the ground and is about two feet higher than the highway.

DESCRIPTION OF BENCH MARK

Designation E 183  
Nearest town Alpena  
Distance and direction from nearest town 5.0 miles west  
Character of mark Standard disk  
Established by USCGS  
Detailed description

The mark is located 4.0 miles west of the intersection of State Highway 32 and the Detroit & Mackinac Railroad tracks, 0.8 miles west of D 183, and about 6000 feet east of the north-south runway extended. The mark is at the northeast corner of the intersection of W-32 with a I-road to the right, and is on U.S. Government property. It is 77 feet north of the centerline of W-32, 10 feet east of the centerline of a dirt road, 2 feet north of a corner fence post, 65 feet west of a tall hemlock tree, and 14 feet southeast of power pole number 20. The mark is 4 feet lower than the highway, set in a 9 inch concrete post projecting 2 inches above the ground. It is a standard disk stamped "E 183 1966".

10721  
10722

DESCRIPTION OF BENCH MARK

Designation F 183  
Nearest town Alpena  
Distance and direction from nearest town 6.3 miles west  
Character of mark Standard disk  
Established by USCGS  
Detailed description

The mark is located at Phelps Collins Airport in the center of the lawn on the east side of the terminal and Weather Bureau building. It is set in the top of a 9 inch concrete post flush with the ground. The mark is 10 feet north of the edge of the south walkway from the terminal, 7 feet west of the airplane parking area and a wire fence, 26.5 feet east of the east face of the terminal, and 11 feet north of the middle walkway from the terminal. Described: N.G.S.

DESCRIPTION OF BENCH MARK

Designation COLLINS  
Nearest town Alpena  
Distance and direction from nearest town 6.5 mi. west  
Character of mark Standard triangulation disk  
Established by USCGS  
Detailed description

The mark is located 6.5 miles west of Alpena, on Phelps Collins Airport at the intersection of 3rd Street and East Avenue, 108 feet southeast of the intersection, 64 feet southwest of the southwest corner of Building 1-10, 35 feet west of a witness post, 34 feet east of the center of 3rd Street, and 20.5 feet west of the southwest leg of the beacon tower. It is a standard disk set in a concrete post flush with the ground and is stamped "COLLINS 1956." Described: BAS

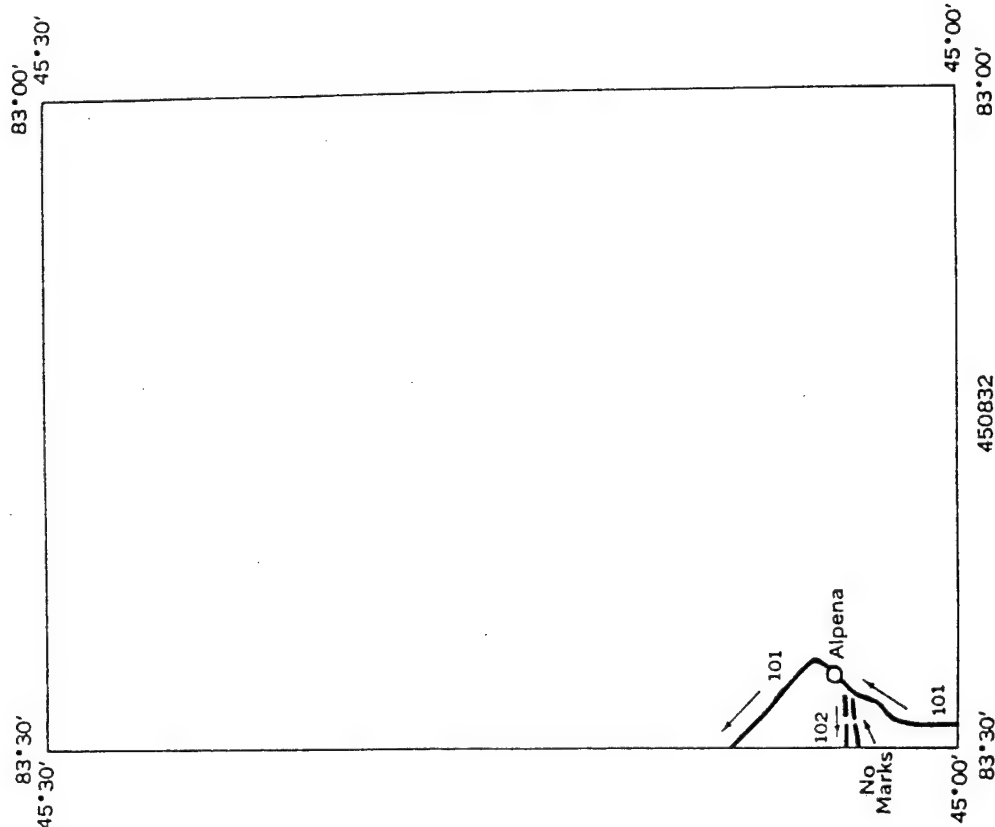
JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

By the  
NATIONAL GEODETIC SURVEY  
SEA-LEVEL DATUM OF 1929

QUAD-----450832  
MICHIGAN  
LATITUDE 45°00' to 45°30'  
LONGITUDE 83°00' to 83°30'  
DIAGRAM ALPENA ILL 17-7



REPLACES EARLIER LIST

USCOMMA-NOAA-ASHEVILLE

## VERTICAL CONTROL DATA

by the  
NATIONAL GEODETTIC SURVEY  
SEA-LEVEL DATUM OF 1929

QUAD 450832  
MICHIGAN  
LATITUDE 45°00' to 45°30'  
LONGITUDE 83°00' to 83°30'  
DIAGRAM ALPENA NL 17-7

LINE 101

ADJUSTMENT OF 1929		H02 L-2350	
W. M. Gibson		1934	
BENCH MARK		ADJUSTED ELEVATION	
H 36	180.878	622.958	
J 36	190.251	624.182	
K 36		DESTROYED	
L 36		DESTROYED	

ADJUSTMENT OF 1966		HOZ L-20817	
E. T. Ogilby	8-11-66	9-19-66	SECOND ORDER
M 36	184.972	606.862	
FIRE LDWK 1941			
(USLS)	180.595	592.502	
PH	NOT RECOVERED		
LIBRARY (USLS)	DESTROYED		
PO (USLS)	180.325	591.616	

## ADJUSTMENT OF 1929

W. M. Gibson	1934	SECOND ORDER
N 36	189.580	621.980
P 36	210.929	692.023

LINE 102

ADJUSTMENT OF 1966		HGT L-20817	
E. T. Ogilby	8-11-66	9-19-66	SECOND ORDER
<u>BENCH MARK</u>	<u>ADJUSTED ELEVATION</u>		
	(METERS)	(FEET)	
A 183	183.722	602.761	
B 183	194.552	638.293	

JANUARY 1973

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

# VERTICAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
SEA LEVEL DATUM OF 1929

QUAD 450832 PAGE 110.3  
MICHIGAN to 45°30'  
LATITUDE to 83°30'  
LONGITUDE 83°00'  
DIAGRAM ALPENA  
LINE 102

LINE 102

## SPUR LINE TO PHELPS COLLINS AIRPORT

### DESCRIPTION OF BENCH MARK

Designation A 183  
Nearest town Alpena  
Distance and direction from nearest town At Alpena  
Character of mark Standard disk  
Established by CGCS  
Detailed description

The mark is located 0.2 mile west of the intersection of State Highway 32 and the Detroit & Macinac Railroad tracks in the center of a grass island in a Michigan State Highway rest area. The mark is 9/16 inch southwest of the center of three 4-foot willow trees, 88 feet west of the centerline of S. Eleventh Street, 85.5 feet south of a drinking fountain, 61 feet east of a blazed maple tree, and 44 feet north of the centerline of State Highway 32. It is a standard disk set in top of a 9-inch concrete post flush with the ground and stamped "A 183 1966".  
The mark is 0.7 mile southwest of H 36 and 0.85 mile east of B 183.

(X)

### DESCRIPTION OF BENCH MARK

Designation B 183  
Nearest town Alpena  
Distance and direction from nearest town 2.0 miles west  
Character of mark Standard disk  
Established by CGCS  
Detailed description

The mark is located 2.0 miles west of Alpena along State Highway 32, 0.85 mile west of A 183, 0.9 mile east of C 183 in the southwest 2X2' concrete guy anchor for the WATZ radio antenna, 179 feet north of the centerline of State Highway 32, 70 feet west of the west face of WATZ radio station building. The mark is a standard disk stamped "B 183 1966" set in the top of the anchor projecting 6 inches and is about 5 feet higher than the highway.

B. 11:

This might be gone by now  
we have a new B.M. set by a  
Power Pole in front of All Phone  
Elec. I don't have the information  
here at Alpena at the present time  
I will get it by the first of next  
week and pass it on to you.  
Copy B.M. included  
C.L.F.T.  
New T included

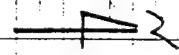
SPUR LINE CONTINUES INTO QUAD 450833

Bm 183 RESET 1991

17LPENT

Elev. 636.238

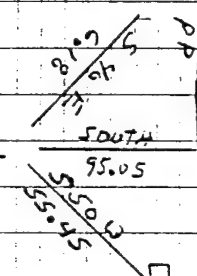
M-32



All Phase

BLDG

SE Cor 4' cone with



SE Cor  
South  
Side post

685

BAGLEY ST

C. Lindgren  
Dist. #4 Surveyor





**Appendix I: Analytical Results; Investigation Derived  
Wastes - Decontamination Water and Soil Cuttings**



# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: Phelp Collins A&G

Attention: JEAN MCKEE

SHEALY Lab No: 44079R  
Description: PPT5002

Coll. Date: 08/23/93  
Coll. Time: 1420

Date Received: 08/24/93  
Date Reported: 08/30/93  
Date Revised: 08/31/93  
\* Extraction Date 08/25/93  
\*\* Blank depletions >0.50 mg/l

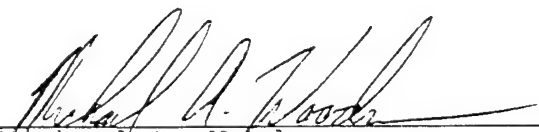
QA/QC Officer YMBE

Parameters	Result	Units	%Spike Recovery	Analyst	Date Analyzed
BOD5-Total	**138	mg/l		KAB	08/25/93
TPH 418.1	<5.0	mg/l		MDE	08/24/93
TSS	10	mg/l		RLB	08/24/93
METALS					
Antimony	<0.020	mg/l	116.0	FT	08/27/93
Arsenic	<0.050	mg/l	97.0	FT	08/27/93
Beryllium	<0.005	mg/l	95.0	FT	08/27/93
Cadmium	<0.005	mg/l	94.0	FT	08/27/93
Chromium	0.036	mg/l	93.0	FT	08/27/93
Copper	<0.010	mg/l	97.0	FT	08/27/93
Lead	<0.020	mg/l	106.0	FT	08/27/93
Mercury	<0.001	mg/l		FT	08/27/93
Nickel	<0.005	mg/l	93.0	FT	08/27/93
Selenium	<0.050	mg/l	100.0	FT	08/27/93
Silver	<0.005	mg/l	99.0	FT	08/27/93
Thallium	<0.100	mg/l	95.0	FT	08/27/93
Zinc	<0.005	mg/l	94.0	FT	08/27/93
VOLATILE ORGANICS METHOD 624				YY	08/24/93
Benzene	<5.0	ug/l	106.0		
Bromochloromethane	<5.0	ug/l			
Bromodichloromethane	<5.0	ug/l			
Bromoform	<5.0	ug/l			
Bromomethane	<10.0	ug/l			
2-Butonane (MEK)	<5.0	ug/l			
Carbon tetrachloride	<5.0	ug/l			
Chlorobenzene	<5.0	ug/l	103.0		
Chloroethane	<10.0	ug/l			
2-Chloroethylvinylether	<5.0	ug/l			
Chloroform	<5.0	ug/l			

Parameters	Result	Units	%Spike Recovery	Analyst	Date Analyzed
Chloromethane	<10.0	ug/l			
Dibromochloromethane	<5.0	ug/l			
1,2-Dibromoethane (EDB)	<5.0	ug/l			
1,2-Dichlorobenzene	<5.0	ug/l			
1,3-Dichlorobenzene	<5.0	ug/l			
1,4-Dichlorobenzene	<5.0	ug/l			
Dichlorodifluoromethane	<10.0	ug/l			
1,1-Dichloroethane	<5.0	ug/l			
1,2-Dichloroethane	<5.0	ug/l			
1,1-Dichloroethene	<5.0	ug/l	99.0		
trans-1,2-Dichloroethene	<5.0	ug/l			
1,2-Dichloropropane	<5.0	ug/l			
cis-1,3-Dichloropropene	<5.0	ug/l			
trans-1,3-Dichloropropene	<5.0	ug/l			
Diisopropylether (IPE)	<5.0	ug/l			
Ethyl benzene	<5.0	ug/l			
Methylene chloride	<5.0	ug/l			
Methyl tertiary butyl ether	<5.0	ug/l			
1,1,2,2-Tetrachloroethane	<5.0	ug/l			
Tetrachloroethene	<5.0	ug/l			
Toluene	<5.0	ug/l	105.0		
1,1,1-Trichloroethane	<5.0	ug/l			
1,1,2-Trichloroethane	<5.0	ug/l			
Trichloroethene	<5.0	ug/l	107.0		
Trichlorofluoromethane	<10.0	ug/l			
Vinyl chloride	<10.0	ug/l			
Total Xylenes	<12.0	ug/l			
Acetonitrile	<100	ug/l		YY	08/24/93
bis(Chloromethyl)ether	<20000	ug/l		YY	08/24/93
ACID EXTRACTABLES *				JAB	08/26/93
4-Chloro-3-methylphenol	<10.0	ug/l	65.1		
2-Chlorophenol	<10.0	ug/l	59.8		
2,4-Dichlorophenol	<10.0	ug/l			
2,4-Dimethylphenol	<10.0	ug/l			
4,6-Dinitro-2-methylphenol	<20.0	ug/l			
2,4-Dinitrophenol	<50.0	ug/l			
2-Nitrophenol	<10.0	ug/l			
4-Nitrophenol	<10.0	ug/l	35.5		
Pentachlorophenol	<10.0	ug/l	50.6		
Phenol	<10.0	ug/l	34.0		
2,4,6-Trichlorophenol	<10.0	ug/l			
BASE NEUTRAL EXTRACTABLES *				JAB	08/26/93
Acenaphthene	<10.0	ug/l	51.6		
Acenaphthylene	<10.0	ug/l			
Anthracene	<10.0	ug/l			
Azobenzene	<10.0	ug/l			
Benzidine	<10.0	ug/l			
Benzo(a)anthracene	<10.0	ug/l			
Benzo(b+k)fluoranthene	<20.0	ug/l			
Benzo(g,h,i)perylene	<10.0	ug/l			
Benzo(a)pyrene	<10.0	ug/l			
bis(2-Chloroethoxy)methane	<10.0	ug/l			
bis(2-Chloroethyl)ether	<10.0	ug/l			
bis(2-Chloroisopropyl)ether	<10.0	ug/l			
bis(2-Ethylhexyl)phthalate	<10.0	ug/l			
4-Bromophenylphenylether	<10.0	ug/l			
Butylbenzylphthalate	<10.0	ug/l			

Parameters	Result	Units	%Spike Recovery	Date Analyst Analyzed
2-Chloronaphthalene	<10.0	ug/l		
4-Chlorophenylphenylether	<10.0	ug/l		
Chrysene	<10.0	ug/l		
p-Cresol	<10.0	ug/l		
o-Cresol	<10.0	ug/l		
Dibenzo(a,h)anthracene	<10.0	ug/l		
1,2-Dichlorobenzene	<10.0	ug/l		
1,3-Dichlorobenzene	<10.0	ug/l		
1,4-Dichlorobenzene	<10.0	ug/l	56.3	
3,3'-Dichlorobenzidine	<10.0	ug/l		
Diethylphthalate	<10.0	ug/l		
Dimethylphthalate	<10.0	ug/l		
di-N-Butylphthalate	<10.0	ug/l		
2,4-Dinitrotoluene	<10.0	ug/l	59.4	
2,6-Dinitrotoluene	<10.0	ug/l		
di-N-Octylphthalate	<10.0	ug/l		
Fluoranthene	<10.0	ug/l		
Fluorene	<10.0	ug/l		
Hexachlorobenzene	<10.0	ug/l		
Hexachlorobutadiene	<10.0	ug/l		
Hexachlorocyclopentadiene	<10.0	ug/l		
Hexachloroethane	<10.0	ug/l		
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l		
Isophorone	<10.0	ug/l		
Naphthalene	<10.0	ug/l		
Nitrobenzene	<10.0	ug/l		
N-Nitrosodimethylamine	<10.0	ug/l		
N-Nitrosodi-N-propylamine	<10.0	ug/l	60.2	
N-Nitrosodiphenylamine	<10.0	ug/l		
Phenanthrene	<10.0	ug/l		
Pyrene	<10.0	ug/l	51.3	
1,2,4-Trichlorobenzene	<10.0	ug/l	53.7	

Reported by:

  
 Michael A. Woodrum  
 Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-


Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44434R  
Description: PPT003

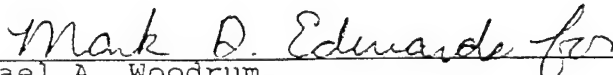
Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Parameters	Result	Units	Analyst	Date Analyzed
TPH 418.1	<5.0	mg/l	MDE	09/07/93

Reported by:

  
Michael A. Woodrum  
Vice President of Analytical Services

## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page: 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

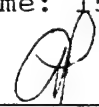
Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44435R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Ext Date 09/02/93  
\* Blank read <10.0 ug/l

Parameters	Result	Units	Analyst	Date Analyzed
ACID EXTRACTABLES			JAB	09/03/93
4-Chloro-3-methylphenol	<10.0	ug/l		
2-Chlorophenol	<10.0	ug/l		
2,4-Dichlorophenol	<10.0	ug/l		
2,4-Dimethylphenol	<10.0	ug/l		
4,6-Dinitro-2-methylphenol	<20.0	ug/l		
2,4-Dinitrophenol	<50.0	ug/l		
2-Nitrophenol	<10.0	ug/l		
4-Nitrophenol	<20.0	ug/l		
Pentachlorophenol	<10.0	ug/l		
Phenol	<20.0	ug/l		
2,4,6-Trichlorophenol	<10.0	ug/l		
BASE NEUTRAL EXTRACTABLES			JAB	09/03/93
Acenaphthene	<10.0	ug/l		
Acenaphthylene	<10.0	ug/l		
Anthracene	<10.0	ug/l		
Azobenzene	<10.0	ug/l		
Benzidine	<10.0	ug/l		
Benzo(a)anthracene	<10.0	ug/l		
Benzo(b+k)fluoranthene	<20.0	ug/l		
Benzo(g,h,i)perylene	<10.0	ug/l		
Benzo(a)pyrene	<10.0	ug/l		
bis(2-Chloroethoxy)methane	<10.0	ug/l		
bis(2-Chloroethyl)ether	<10.0	ug/l		
bis(2-Chloroisopropyl)ether	<20.0	ug/l		
bis(2-Ethylhexyl)phthalate	*998	ug/l		
4-Bromophenylphenylether	<10.0	ug/l		
Butylbenzylphthalate	<10.0	ug/l		
2-Chloronaphthalene	<10.0	ug/l		
4-Chlorophenylphenylether	<10.0	ug/l		



Chrysene	<10.0	ug/l		
Dibenzo(a,h)anthracene	<10.0	ug/l		
1,2-Dichlorobenzene	<10.0	ug/l		
1,3-Dichlorobenzene	<10.0	ug/l		
1,4-Dichlorobenzene	<10.0	ug/l		
3,3'-Dichlorobenzidine	<10.0	ug/l		
Diethylphthalate	<10.0	ug/l		
Dimethylphthalate	<10.0	ug/l		
di-N-Butylphthalate	<10.0	ug/l		
2,4-Dinitrotoluene	<10.0	ug/l		
2,6-Dinitrotoluene	<10.0	ug/l		
di-N-Octylphthalate	*43.1	ug/l		
Fluoranthene	<10.0	ug/l		
Fluorene	<10.0	ug/l		
Hexachlorobenzene	<10.0	ug/l		
Hexachlorobutadiene	<10.0	ug/l		
Hexachlorocyclopentadiene	<10.0	ug/l		
Hexachloroethane	<10.0	ug/l		
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l		
Isophorone	<10.0	ug/l		
Naphthalene	<10.0	ug/l		
Nitrobenzene	<10.0	ug/l		
N-Nitrosodimethylamine	<20.0	ug/l		
N-Nitrosodi-N-propylamine	<10.0	ug/l		
N-Nitrosodiphenylamine	<10.0	ug/l		
Phenanthrene	<10.0	ug/l		
Pyrene	<10.0	ug/l		
1,2,4-Trichlorobenzene	<10.0	ug/l		
m+p-Cresol	<20.0	ug/l		
o-Cresol	<10.0	ug/l		

Reported by: Mark D. Edwards for  
Michael A. Woodrum  
Vice President Analytical Services

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## CERTIFICATE OF ANALYSIS

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NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44436R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/04/93

QA/QC Officer

Parameters	Result	Regulatory Limit	Units	%Spike Recovery	Analyst	Date Analyzed
METALS					FT	09/02/93
Antimony	<0.020		mg/l	86.0		
Arsenic	<0.050		mg/l	106.0		
Beryllium	<0.005		mg/l	95.0		
Cadmium	<0.005		mg/l	90.0		
Chromium	0.026		mg/l	94.0		
Copper	0.015		mg/l	91.0		
Lead	<0.050		mg/l	101.0		
Nickel	<0.005		mg/l	91.0		
Selenium	<0.050		mg/l	99.0		
Silver	<0.005		mg/l	86.0		
Thallium	<0.100		mg/l	99.0		
Zinc	<0.005		mg/l	94.0		

Reported by: Mark D. Edwards for  
Michael A. Woodrum  
Vice President Analytical Services

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TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-


Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44437R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

\* BOD received out of holding time, not analyzed per client.

Parameters	Result	Units	Analyst	Date Analyzed
BOD5-Total	*	mg/l		
TSS	20	mg/l	RLB	09/03/93

Reported by:

  
Michael A. Woodrum

Vice President of Analytical Services

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Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: Hazwrap-Phelps Collins Ang

Attention: PATRICK LAY

SHEALY Lab No: 44438R  
Description: PPT003

Coll. Date: 08/31/93  
Coll. Time: 1530

Date Received: 09/02/93  
Date Reported: 09/07/93

QA/QC Officer 

Parameters	Result	Units	Analyst	Date Analyzed
VOLATILE ORGANICS METHOD 624			YY	09/02/93
Benzene	<5.0	ug/l		
Bromochloromethane	<5.0	ug/l		
Bromodichloromethane	<5.0	ug/l		
Bromoform	<5.0	ug/l		
Bromomethane	<10.0	ug/l		
2-Butonane (MEK)	<5.0	ug/l		
Carbon tetrachloride	<5.0	ug/l		
Chlorobenzene	<5.0	ug/l		
Chloroethane	<10.0	ug/l		
2-Chloroethylvinylether	<5.0	ug/l		
Chloroform	<5.0	ug/l		
Chloromethane	<10.0	ug/l		
Dibromochloromethane	<5.0	ug/l		
1,2-Dibromoethane (EDB)	<5.0	ug/l		
1,2-Dichlorobenzene	<5.0	ug/l		
1,3-Dichlorobenzene	<5.0	ug/l		
1,4-Dichlorobenzene	<5.0	ug/l		
Dichlorodifluoromethane	<10.0	ug/l		
1,1-Dichloroethane	<5.0	ug/l		
1,2-Dichloroethane	<5.0	ug/l		
1,1-Dichloroethene	<5.0	ug/l		
trans-1,2-Dichloroethene	<5.0	ug/l		
1,2-Dichloropropane	<5.0	ug/l		
cis-1,3-Dichloropropene	<5.0	ug/l		
trans-1,3-Dichloropropene	<5.0	ug/l		
Diisopropylether (IPE)	<5.0	ug/l		
Ethyl benzene	<5.0	ug/l		

Methylene chloride	<5.0	ug/l		
Methyl tertiary butyl ether (MTBE)	<5.0	ug/l		
Naphthalene	<5.0	ug/l		
1,1,2,2-Tetrachloroethane	<5.0	ug/l		
Tetrachloroethene	<5.0	ug/l		
Toluene	<5.0	ug/l		
1,1,1-Trichloroethane	<5.0	ug/l		
1,1,2-Trichloroethane	<5.0	ug/l		
Trichloroethene	<5.0	ug/l		
Trichlorofluoromethane	<10.0	ug/l		
Vinyl chloride	<10.0	ug/l		
Total Xylenes	<12.0	ug/l		
Acrolein	<50.0	ug/l		
Acrylonitrile	<50.0	ug/l		
Acetonitrile	<100	ug/l		
bis(Chloromethyl)ether	<20000	ug/l		

Reported by:

Mark D. Edwards for  
Michael A. Woodrum  
Vice President of Analytical Services

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TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Project Name: PHELPS COLLINS ANG CRTIC RI

Attention: PATRICK LAY

SHEALY Lab No: 45203  
Description: P10002

Coll. Date: 09/15/93

Coll. Time: 2108

Date Received: 09/17/93

Date Reported: 10/06/93

QA/QC Officer MAC

\*Ext Date 09/21/93

\*\*bis(2-Ethylhexyl)phthalate &lt;10.0 ug/l in blank

Parameters	Result	Units	Analyst	Date Analyzed
BOD5-Total	27	mg/l	RLB	09/17/93
TPH 418.1	<5.00	mg/l	MDE	09/22/93
TSS	445	mg/l	RLB	09/21/93
METALS				
Antimony	<0.020	mg/l	FT	10/05/93
Arsenic	0.090	mg/l	FT	10/05/93
Beryllium	<0.010	mg/l	FT	10/05/93
Cadmium	<0.010	mg/l	FT	10/05/93
Chromium	<0.020	mg/l	FT	10/05/93
Copper	0.187	mg/l	FT	10/05/93
Lead	0.337	mg/l	FT	10/05/93
Mercury	<0.001	mg/l	FT	09/29/93
Nickel	<0.010	mg/l	FT	10/05/93
Selenium	<0.050	mg/l	FT	10/05/93
Silver	<0.005	mg/l	FT	10/05/93
Thallium	<0.500	mg/l	FT	10/05/93
Zinc	0.370	mg/l	FT	10/05/93
VOLATILE ORGANICS METHOD 624			YY	09/17/93
Benzene	<5.0	ug/l		
Bromochloromethane	<5.0	ug/l		
Bromodichloromethane	<5.0	ug/l		
Bromoform	<5.0	ug/l		
Bromomethane	<10.0	ug/l		
2-Butonane (MEK)	<5.0	ug/l		
Carbon tetrachloride	<5.0	ug/l		
Chlorobenzene	<5.0	ug/l		
Chloroethane	<10.0	ug/l		
2-Chloroethylvinylether	<5.0	ug/l		
Chloroform	<5.0	ug/l		

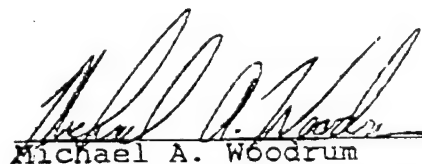
## Parameters

Result Units Analyst Date Analyzed

Chloromethane	<10.0	ug/l		
Dibromochloromethane	<5.0	ug/l		
1,2-Dibromoethane (EDB)	<5.0	ug/l		
1,2-Dichlorobenzene	<5.0	ug/l		
1,3-Dichlorobenzene	<5.0	ug/l		
1,4-Dichlorobenzene	<5.0	ug/l		
Dichlorodifluoromethane	<10.0	ug/l		
1,1-Dichloroethane	<5.0	ug/l		
1,2-Dichloroethane	<5.0	ug/l		
1,1-Dichloroethene	<5.0	ug/l		
trans-1,2-Dichloroethene	<5.0	ug/l		
1,2-Dichloropropane	<5.0	ug/l		
cis-1,3-Dichloropropene	<5.0	ug/l		
trans-1,3-Dichloropropene	<5.0	ug/l		
Diisopropylether (IPE)	<5.0	ug/l		
Ethyl benzene	<5.0	ug/l		
Methylene chloride	<5.0	ug/l		
Methyl tertiary butyl ether (MTBE)	<5.0	ug/l		
Naphthalene	<5.0	ug/l		
1,1,2,2-Tetrachloroethane	<5.0	ug/l		
Tetrachloroethene	<5.0	ug/l		
Toluene	<5.0	ug/l		
1,1,1-Trichloroethane	<5.0	ug/l		
1,1,2-Trichloroethane	<5.0	ug/l		
Trichloroethene	<5.0	ug/l		
Trichlorofluoromethane	<10.0	ug/l		
Vinyl chloride	<10.0	ug/l		
Total Xylenes	<12.0	ug/l		
Acetonitrile	<100	ug/l		
bis(Chloromethyl) ether	<20000	ug/l		
ACID EXTRACTABLES *			JAB	09/28/93
4-Chloro-3-methylphenol	<10.0	ug/l		
2-Chlorophenol	<10.0	ug/l		
2,4-Dichlorophenol	<10.0	ug/l		
2,4-Dimethylphenol	<10.0	ug/l		
4,6-Dinitro-2-methylphenol	<20.0	ug/l		
2,4-Dinitrophenol	<10.0	ug/l		
2-Nitrophenol	<10.0	ug/l		
4-Nitrophenol	<10.0	ug/l		
Pentachlorophenol	<10.0	ug/l		
Phenol	<10.0	ug/l		
2,4,6-Trichlorophenol	<10.0	ug/l		
BASE NEUTRAL EXTRACTABLES *			JAB	09/28/93
Acenaphthene	<10.0	ug/l		
Acenaphthylene	<10.0	ug/l		
Anthracene	<10.0	ug/l		
Azobenzene	<10.0	ug/l		
Benzidine	<10.0	ug/l		
Benzo(a)anthracene	<10.0	ug/l		
Benzo(b+k)fluoranthene	<20.0	ug/l		
Benzo(g,h,i)perylene	<10.0	ug/l		
Benzo(a)pyrene	<10.0	ug/l		
bis(2-Chloroethoxy)methane	<10.0	ug/l		
bis(2-Chloroethyl) ether	<10.0	ug/l		
bis(2-Chloroisopropyl) ether	<10.0	ug/l		
bis(2-Ethylhexyl)phthalate	**33.4	ug/l		
4-Bromophenylphenylether	<10.0	ug/l		

	Result	Units	Analyst	Date Analyzed
Butylbenzylphthalate	<10.0	ug/l		
2-Chloronaphthalene	<10.0	ug/l		
4-Chlorophenylphenylether	<20.0	ug/l		
Chrysene	<10.0	ug/l		
Dibenzo(a,h)anthracene	<10.0	ug/l		
1,2-Dichlorobenzene	<10.0	ug/l		
1,3-Dichlorobenzene	<10.0	ug/l		
1,4-Dichlorobenzene	<10.0	ug/l		
3,3'-Dichlorobenzidine	<10.0	ug/l		
Diethylphthalate	<20.0	ug/l		
Dimethylphthalate	<10.0	ug/l		
di-N-Butylphthalate	<10.0	ug/l		
2,4-Dinitrotoluene	<10.0	ug/l		
2,6-Dinitrotoluene	<10.0	ug/l		
di-N-Octylphthalate	<10.0	ug/l		
Fluoranthene	<10.0	ug/l		
Fluorene	<10.0	ug/l		
Hexachlorobenzene	<10.0	ug/l		
Hexachlorobutadiene	<10.0	ug/l		
Hexachlorocyclopentadiene	<10.0	ug/l		
Hexachloroethane	<10.0	ug/l		
Indeno(1,2,3-c,d)pyrene	<10.0	ug/l		
Isophorone	<10.0	ug/l		
Naphthalene	<10.0	ug/l		
Nitrobenzene	<10.0	ug/l		
N-Nitrosodimethylamine	<10.0	ug/l		
N-Nitrosodi-N-propylamine	<10.0	ug/l		
N-Nitrosodiphenylamine	<20.0	ug/l		
Phenanthrene	<10.0	ug/l		
Pyrene	<10.0	ug/l		
1,2,4-Trichlorobenzene	<10.0	ug/l		
m+p-Cresol	<20.0	ug/l		
o-Cresol	<10.0	ug/l		

Reported by:

  
Michael A. Woodrum  
Vice President of Analytical Services





## **TCLP Analytical Results for Soil Cuttings**



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Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45146  
Description: DECON

Coll. Date: 09/13/93  
Coll. Time: 1836


Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*CMJ*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
TCLP METALS					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.419	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	0.039	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.002	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
TCLP VOLATILES					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
TCLP SEMIVOLATILES					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

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**Client:** EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

**Attention:** Jean McKee

SHEALY Lab No: 45147  
Description: LF6MW8

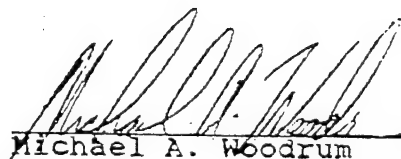
Coll. Date: 09/13/93  
Coll. Time: 1912

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMF

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.614	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45148  
Description: S1COMP

Coll. Date: 09/13/93  
Coll. Time: 2000

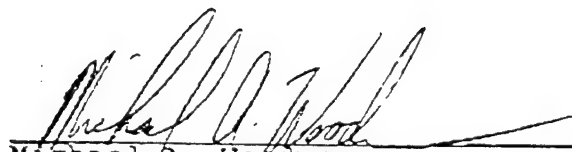
Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMJ

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.319	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>				YY	09/23/93
Benzene	<0.10	0.5	mg/l		
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>				JAB	09/22/93
m+p-Cresol	<0.020	200.0	mg/l		
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		



Reported by:



Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS. TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

**Client:** EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

**Attention:** Jean McKee

SHEALY Lab No: 45149  
Description: SF5MW8

Coll. Date: 09/13/93  
Coll. Time: 1905

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMF

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.629	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:



Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
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(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964  
Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45150  
Description: RT9MW6

Coll. Date: 09/13/93  
Coll. Time: 1930

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMJ

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.346	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/23/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:

  
\_\_\_\_\_  
Michael A. Woodrum  
Vice President Analytical Services

# SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
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(803) 791-9700  
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## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964

Page 1

**Client:** EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

**Attention:** Jean McKee

SHEALY Lab No: 45151  
Description: C63P21

Coll. Date: 09/13/93  
Coll. Time: 1948


Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer CMF

\* Pentachlorophenol <0.020 mg/l in blank

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
<b>TCLP METALS</b>					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.319	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
<b>TCLP VOLATILES</b>					
Benzene	<0.10	0.5	mg/l	YY	09/24/93
Carbon tetrachloride	<0.10	0.5	mg/l		
Chlorobenzene	<0.10	100.0	mg/l		
Chloroform	<0.10	6.0	mg/l		
1,4-Dichlorobenzene	<0.10	7.5	mg/l		
1,2-Dichloroethane	<0.10	0.5	mg/l		
1,1-Dichloroethene	<0.10	0.7	mg/l		
Methyl ethyl ketone	<0.10	200.0	mg/l		
Tetrachloroethene	<0.10	0.7	mg/l		
Trichloroethene	<0.10	0.5	mg/l		
Vinyl chloride	<0.20	0.2	mg/l		
<b>TCLP SEMIVOLATILES</b>					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/23/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	*0.182	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		

Reported by:

  
\_\_\_\_\_  
Michael A. Woodrum  
Vice President Analytical Services

## SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS &amp; CHEMISTS

106 VANTAGE POINT DRIVE  
OVERLOOK BUSINESS CENTER  
CAYCE, SOUTH CAROLINA 29033  
(803) 791-9700  
FAX (803) 791-9111

## CERTIFICATE OF ANALYSIS

SC DHEC CERTIFICATION NO. 26103  
NC DEM NO. 329  
VA VDH-DWSE NO. 00303  
TN DHE NO. 2964

Page 1

Client: EARTH TECHNOLOGY CENTER  
683 EMORY VALLEY RD.  
OAK RIDGE, TN 37830-

Attention: Jean McKee

SHEALY Lab No: 45152  
Description: MP2SB5

Coll. Date: 09/14/93  
Coll. Time: 0745

Date Received: 09/16/93  
Date Reported: 10/06/93

QA/QC Officer

*CMJ*

Parameters	Result	Regulatory Limit	Units	Analyst	Date Analyzed
TCLP METALS					
Arsenic	<0.050	5.0	mg/l	FT	10/01/93
Barium	0.351	100.0	mg/l	FT	10/01/93
Cadmium	<0.005	1.0	mg/l	FT	10/01/93
Chromium	<0.010	5.0	mg/l	FT	10/01/93
Lead	<0.050	5.0	mg/l	FT	10/01/93
Mercury	<0.001	0.2	mg/l	FT	09/28/93
Selenium	<0.050	1.0	mg/l	FT	10/01/93
Silver	<0.005	5.0	mg/l	FT	10/01/93
TCLP VOLATILES					
Benzene	<0.010	0.5	mg/l	YY	09/24/93
Carbon tetrachloride	<0.010	0.5	mg/l		
Chlorobenzene	<0.010	100.0	mg/l		
Chloroform	<0.010	6.0	mg/l		
1,4-Dichlorobenzene	<0.010	7.5	mg/l		
1,2-Dichloroethane	<0.010	0.5	mg/l		
1,1-Dichloroethene	<0.010	0.7	mg/l		
Methyl ethyl ketone	<0.010	200.0	mg/l		
Tetrachloroethene	<0.010	0.7	mg/l		
Trichloroethene	<0.010	0.5	mg/l		
Vinyl chloride	<0.020	0.2	mg/l		
TCLP SEMIVOLATILES					
m+p-Cresol	<0.020	200.0	mg/l	JAB	09/22/93
o-Cresol	<0.010	200.0	mg/l		
2,4-Dinitrotoluene	<0.010	0.13	mg/l		
Hexachlorobenzene	<0.010	0.13	mg/l		
Hexachloro-1,3-butadiene	<0.010	0.5	mg/l		
Hexachloroethane	<0.010	3.0	mg/l		
Nitrobenzene	<0.010	2.0	mg/l		
Pentachlorophenol	<0.020	100.0	mg/l		
Pyridine	<0.010	5.0	mg/l		
2,4,5-Trichlorophenol	<0.010	400.0	mg/l		
2,4,6-Trichlorophenol	<0.010	2.0	mg/l		



Reported by:



Michael A. Woodrum  
Vice President Analytical Services